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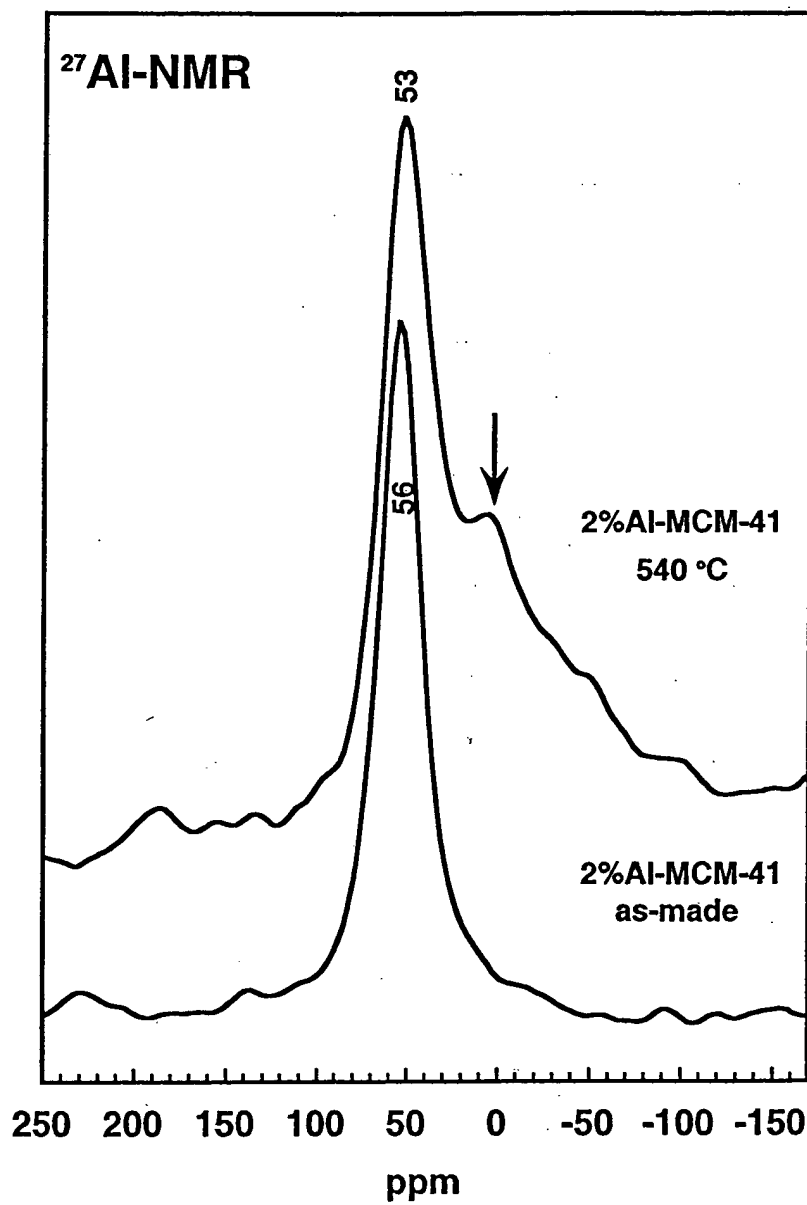


Figure 1

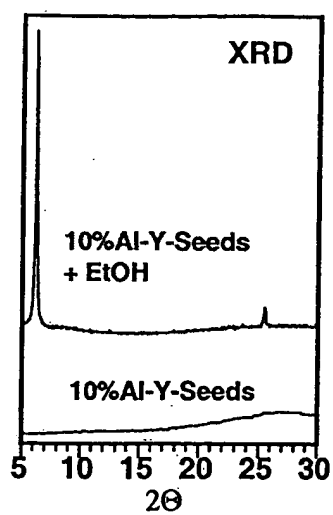


Figure 2A

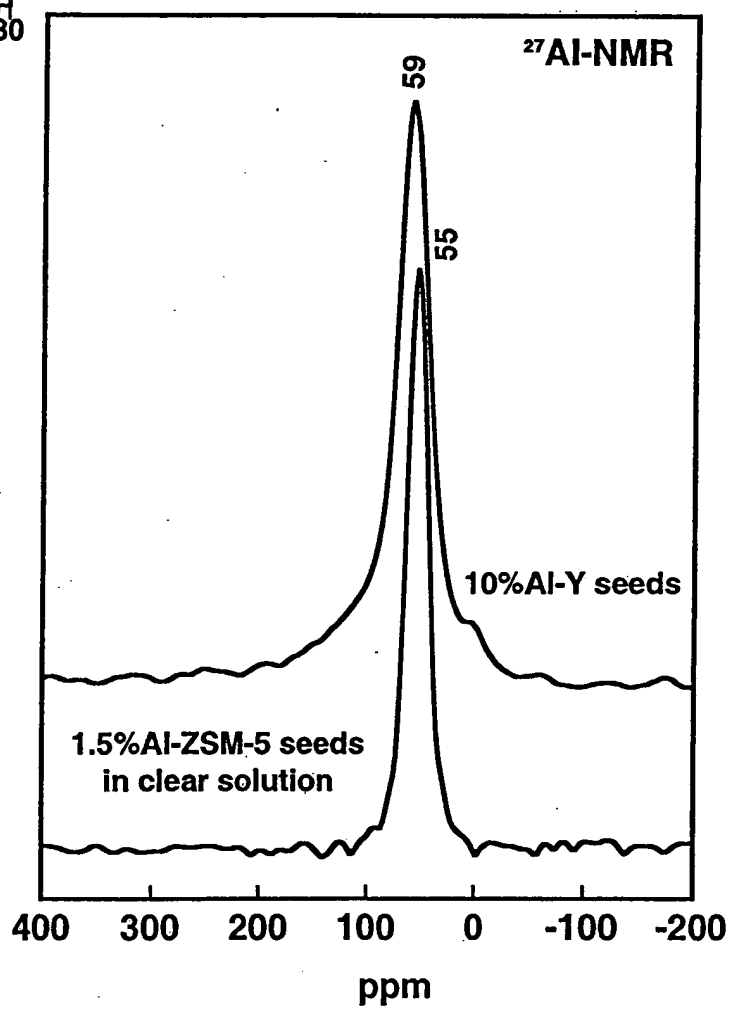


Figure 2

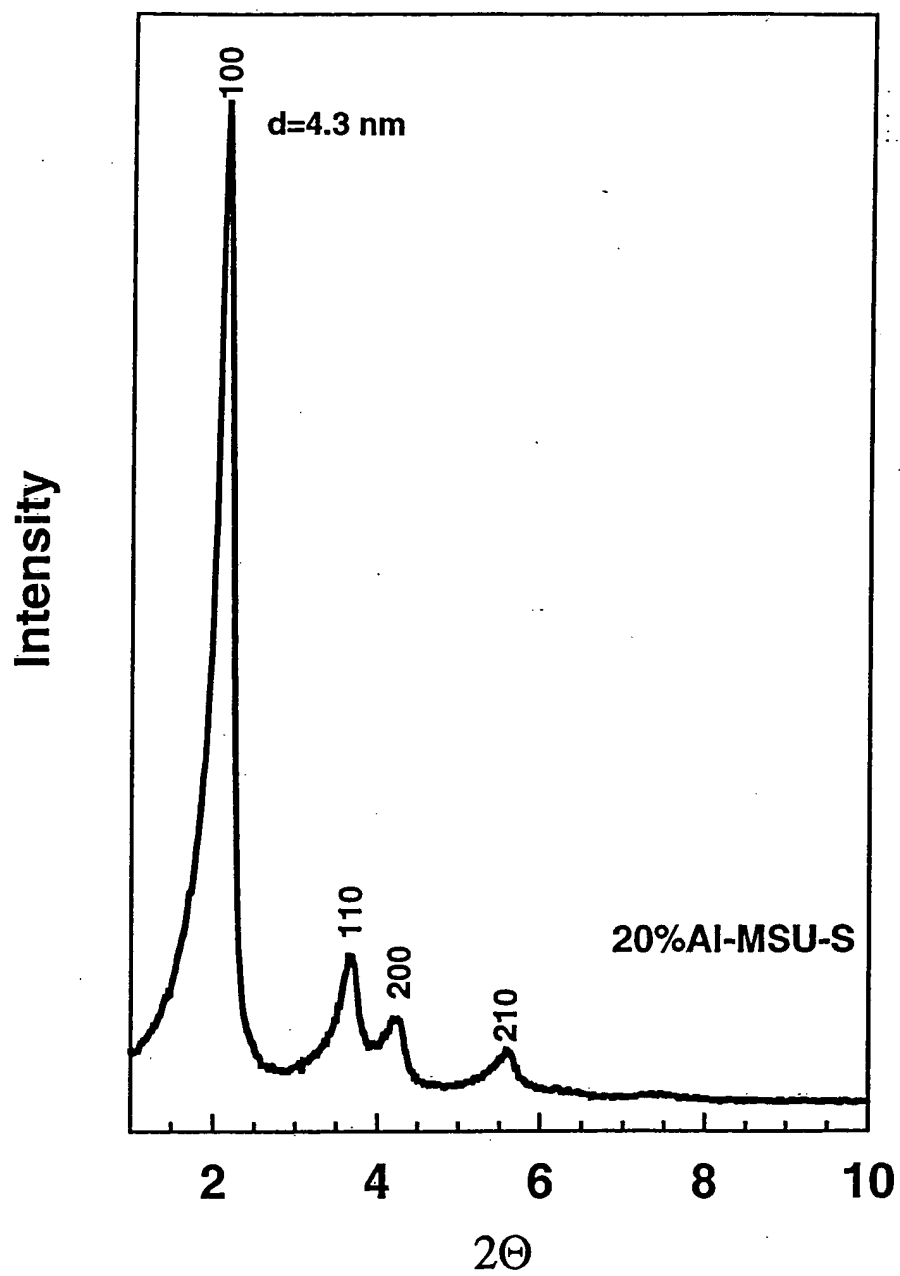


Figure 3

1003647 2493004

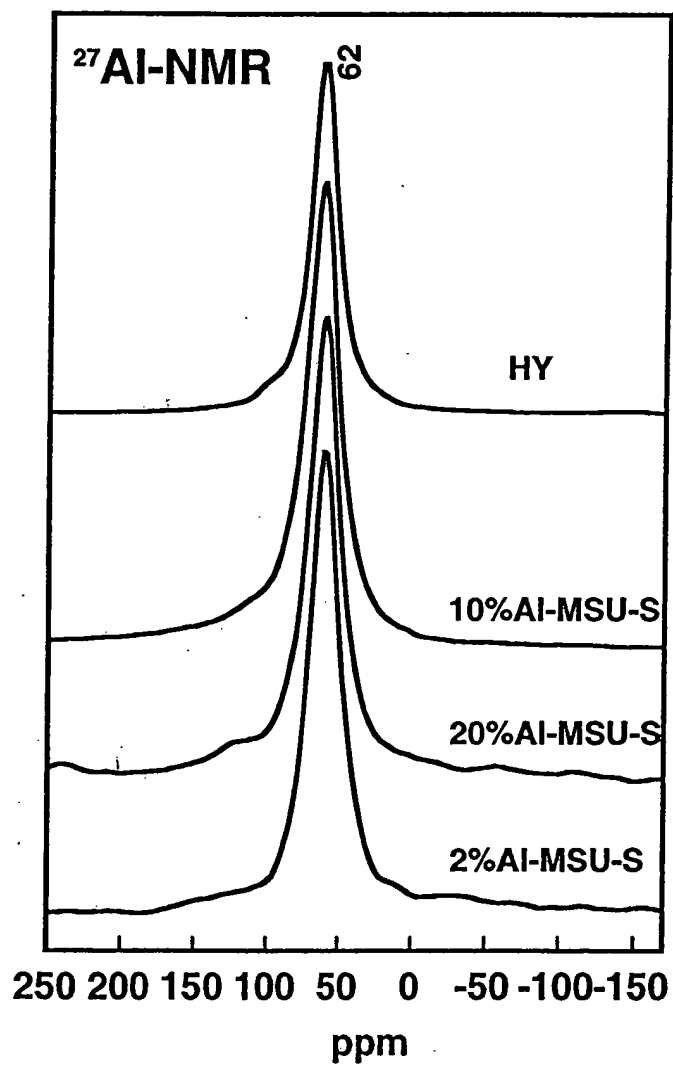


Figure 4

The figure displays two X-ray diffraction (XRD) patterns. The y-axis is labeled 'Intensity' and the x-axis is labeled '2θ' with numerical markers at 2, 4, 6, 8, and 10. The upper curve, labeled '10%Al-MSU-S (Cubic, form Y seeds)', shows a sharp, high-intensity peak at 2θ ≈ 2.1, labeled '211', and a smaller peak at 2θ ≈ 2.6, labeled '220'. The lower curve, labeled '2%Al-MCM-48 (From conventional precursors)', shows a broad, low-intensity peak centered around 2θ ≈ 4.5, with small labels '400', '420', and '332' indicating specific diffraction points within this broad feature.

### Figure 5

**<sup>27</sup>Al-NMR**

The figure displays two stacked <sup>27</sup>Al-NMR spectra. The x-axis represents the chemical shift in ppm, ranging from 250 to -150. The top spectrum, labeled "10%Al-MSU-S (From Y seeds)", shows a sharp peak at 62 ppm and a smaller peak at 58 ppm. The bottom spectrum, labeled "2%Al-MCM-48 (From conventional precursors)", shows a broad peak centered around 58 ppm. An arrow points to this broad peak with the label "2%Al-MCM-48 (From conventional precursors)".

### Figure 6

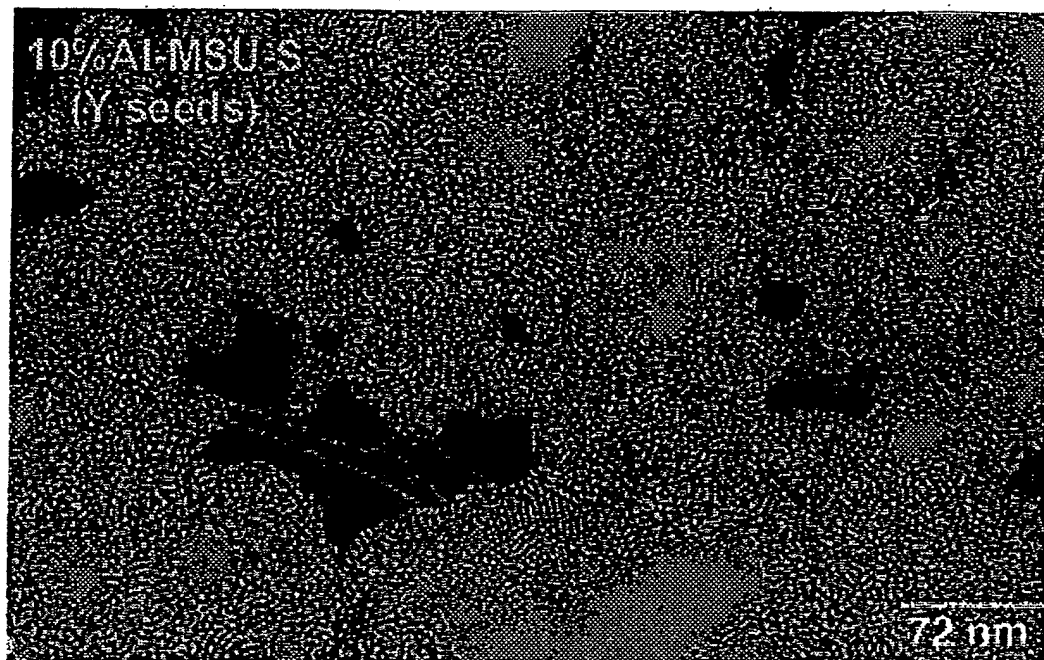


Figure 7



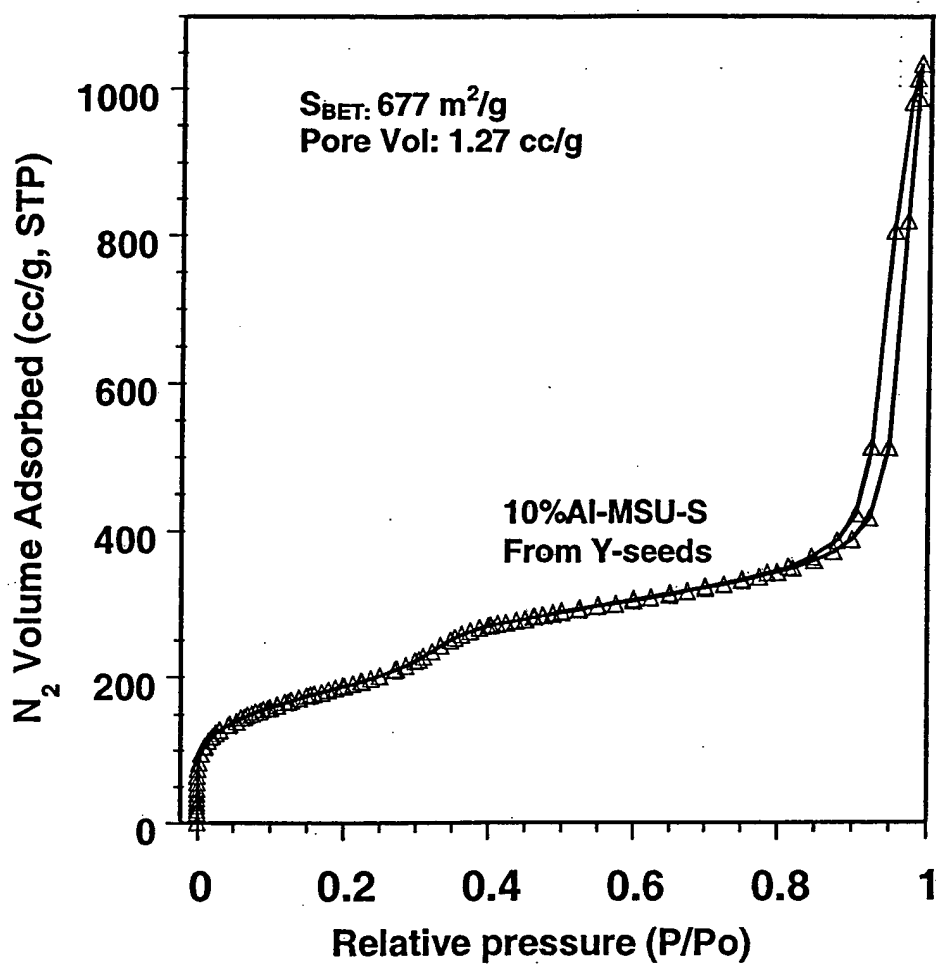


Figure 8

1005547-121904

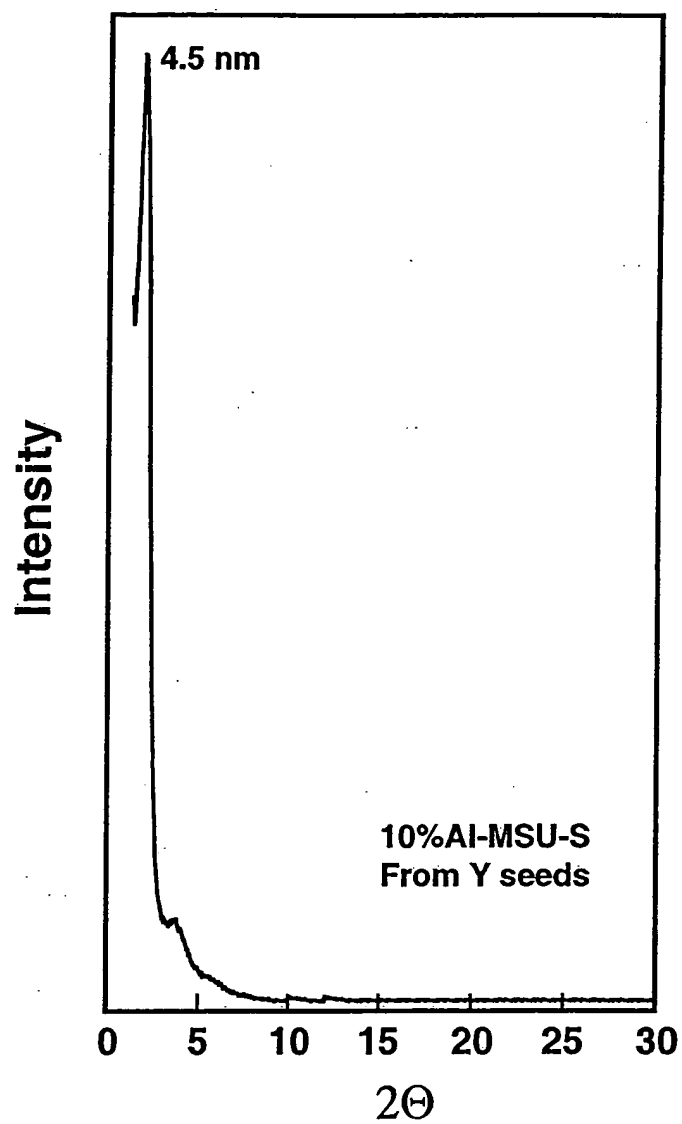


Figure 9

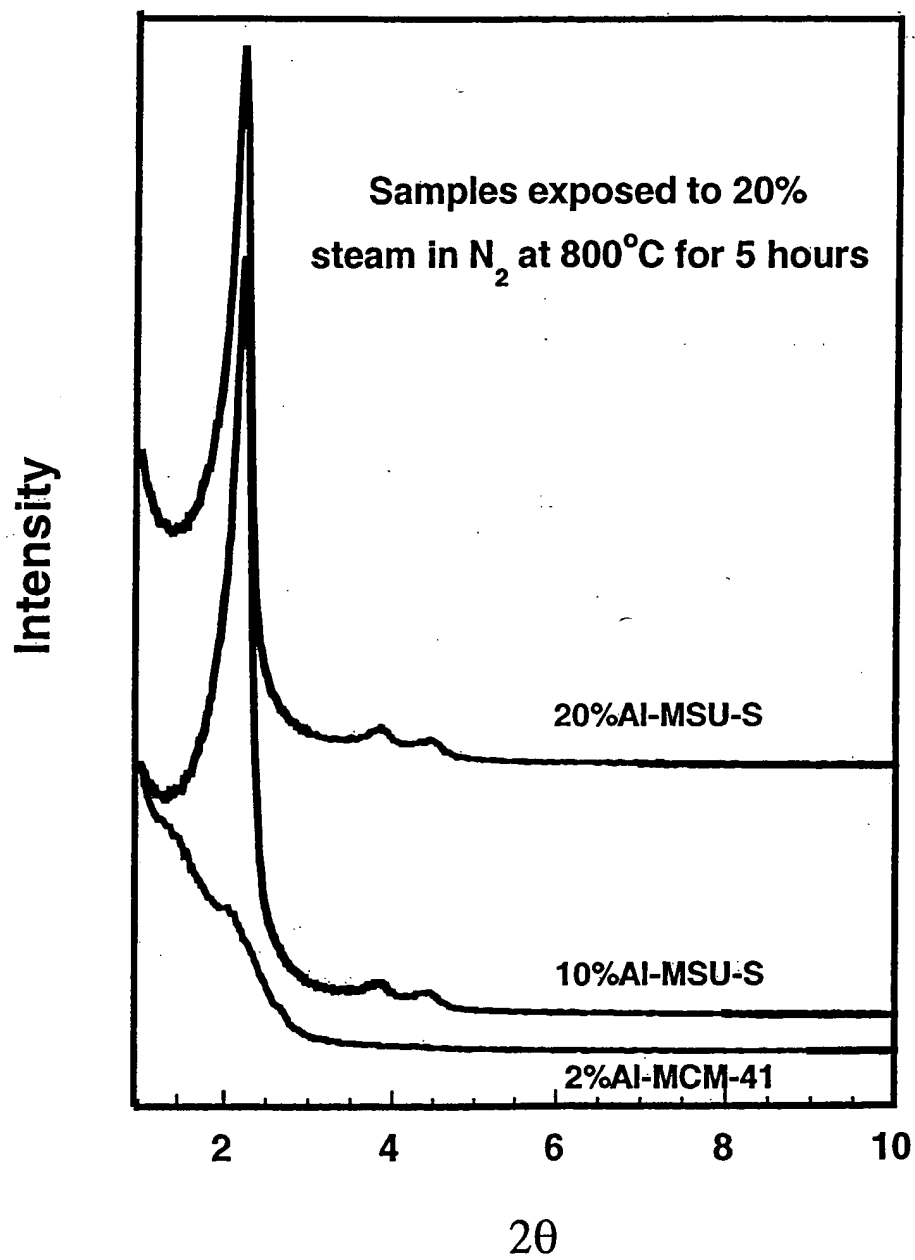


Figure 10

# Testing of Mokaya's Al-MCM-41(Si/Al=6.1)

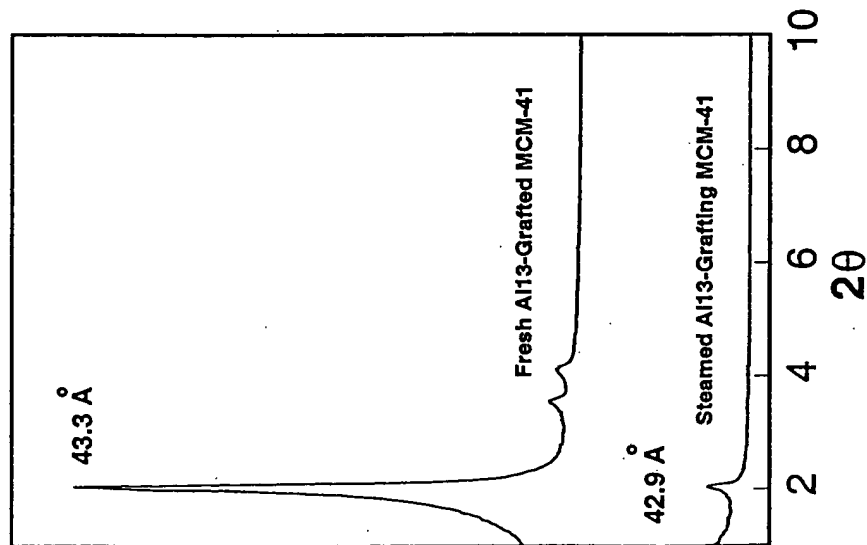


Figure 11A

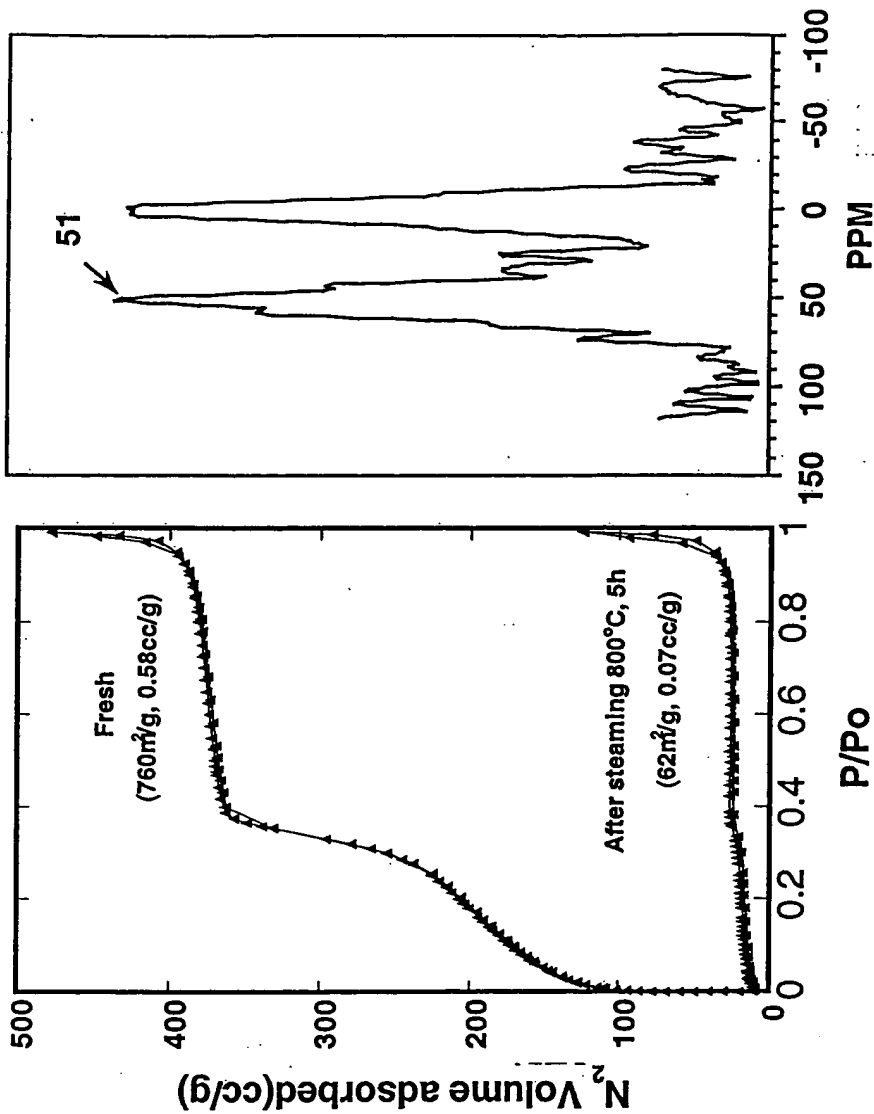
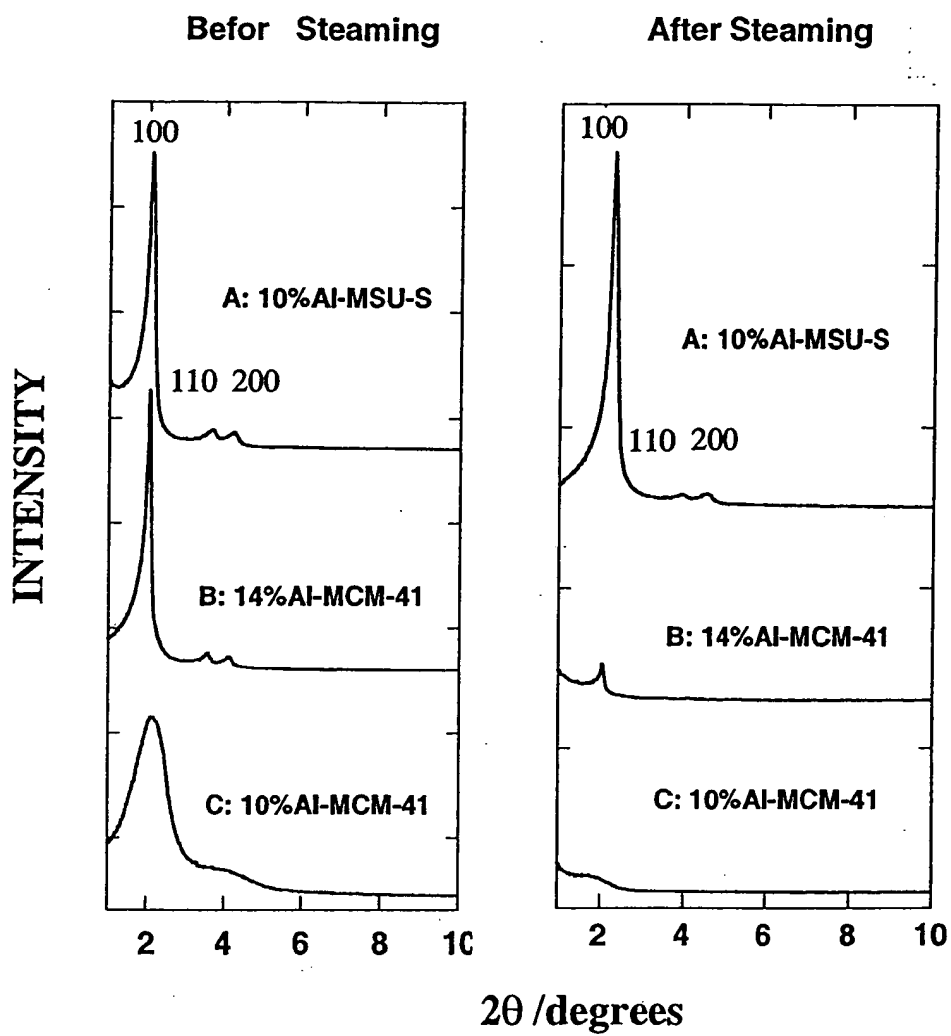


Figure 11B

Figure 11C

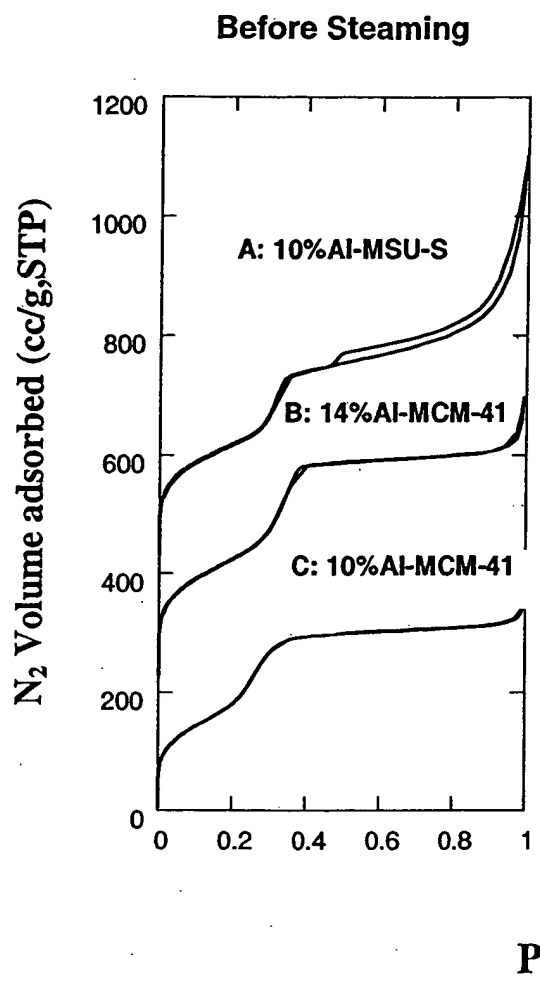
1005647 134304  
1005647 134304



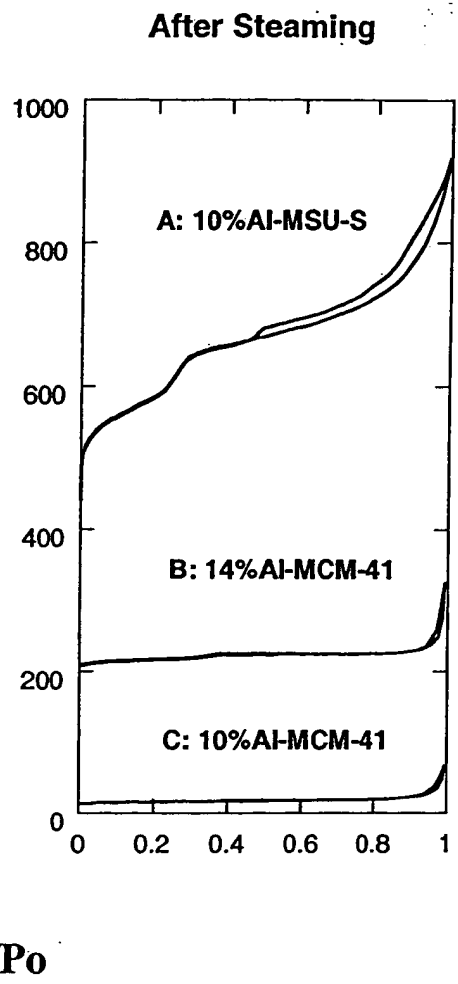
**Figure 12A**

**Figure 12B**

1005647 4992001



**Figure 13A**



**Figure 13B**

Figure 1 is a line graph showing Cumene conversion (%) on the y-axis (ranging from 0 to 70) versus Temperature (°C) on the x-axis (ranging from 300 to 450). Four catalysts are compared: A (marked with 'x'), B (marked with '+'), C (marked with squares), and D (marked with diamonds). All catalysts show an increase in conversion with increasing temperature. Catalyst A shows the highest conversion, followed by B, C, and D.

Temperature (°C)	Catalyst A (%)	Catalyst B (%)	Catalyst C (%)	Catalyst D (%)
300	42	41	23	7
350	47	43	25	9
400	56	52	37	11
450	62	61	46	12

### Figure 14

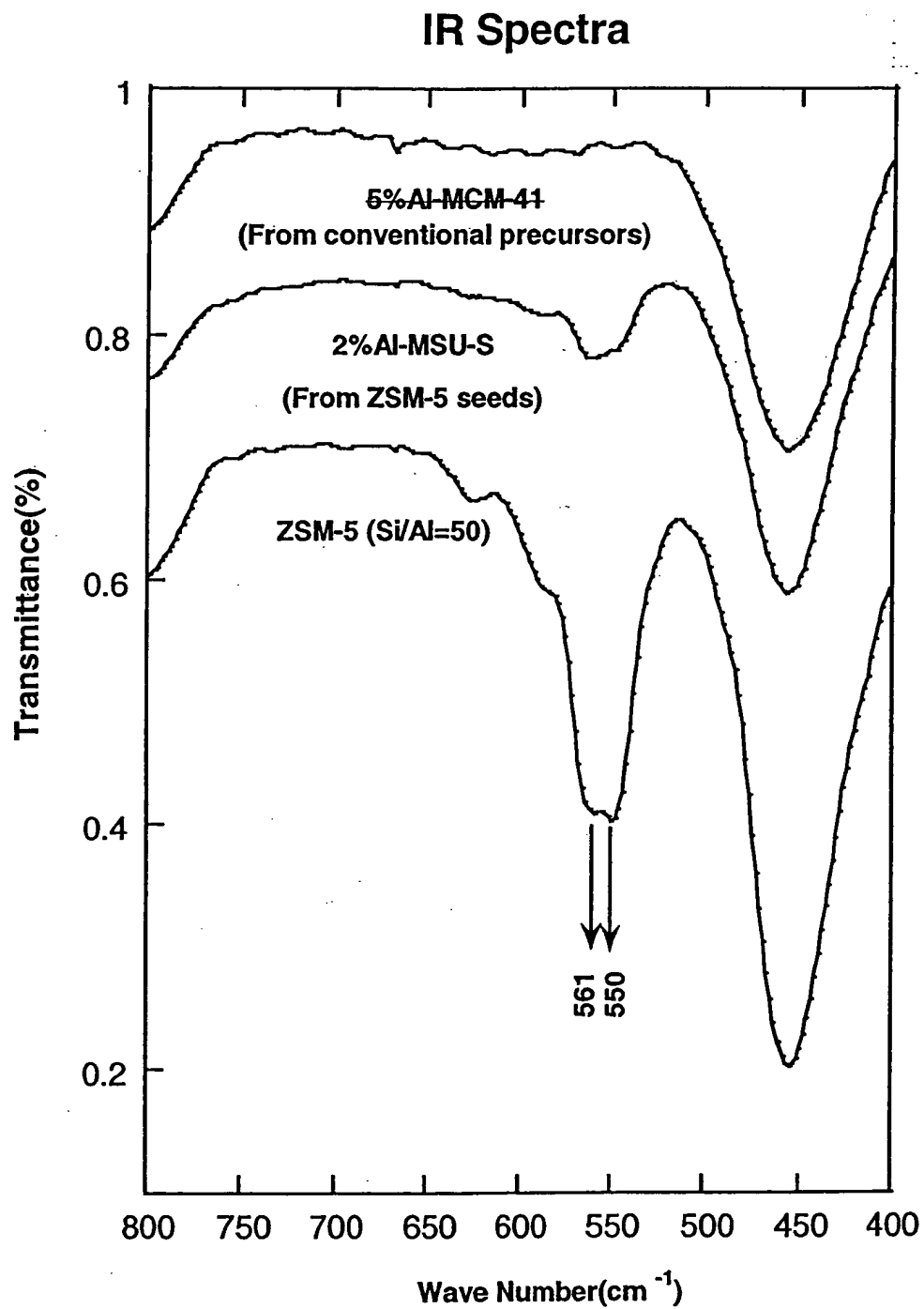
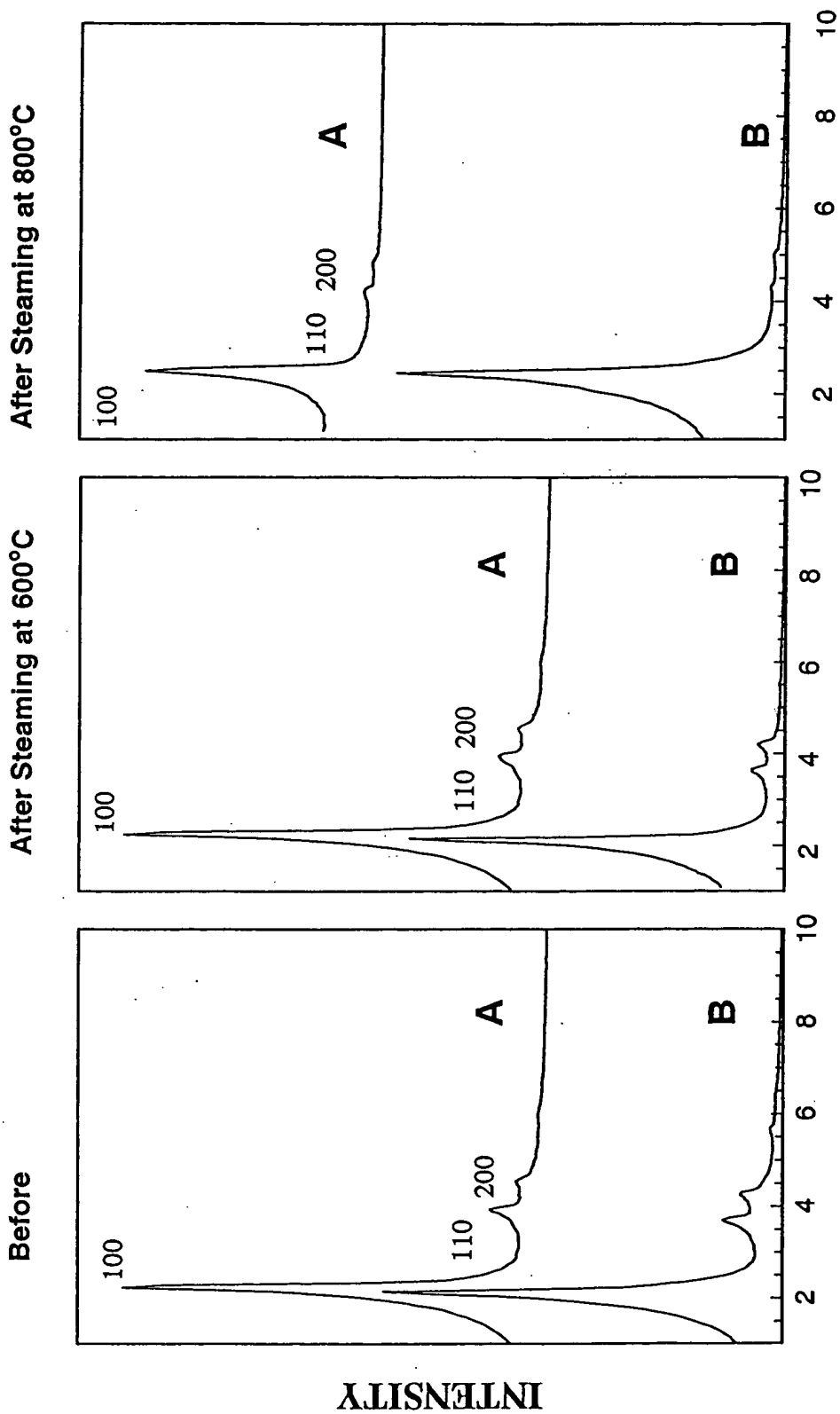


Figure 15







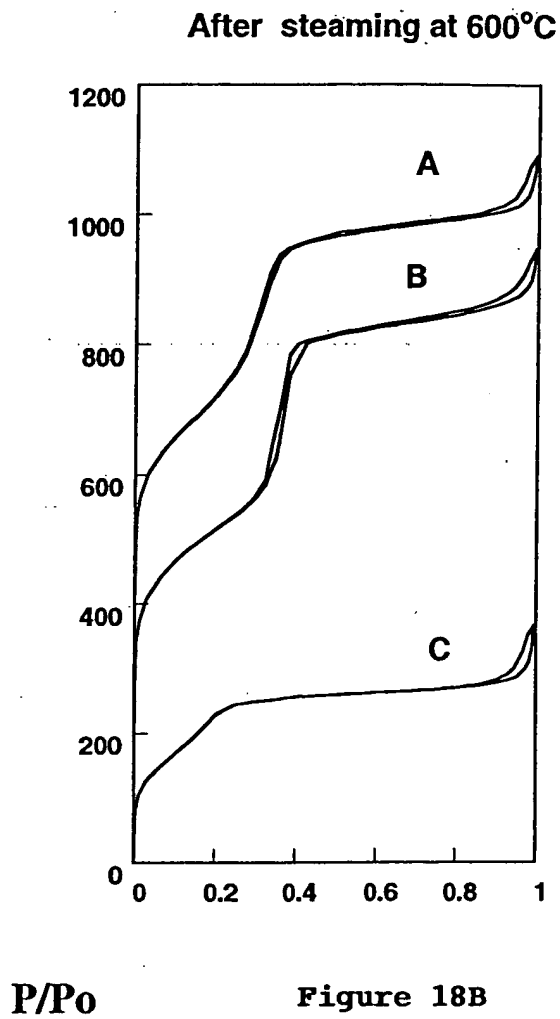
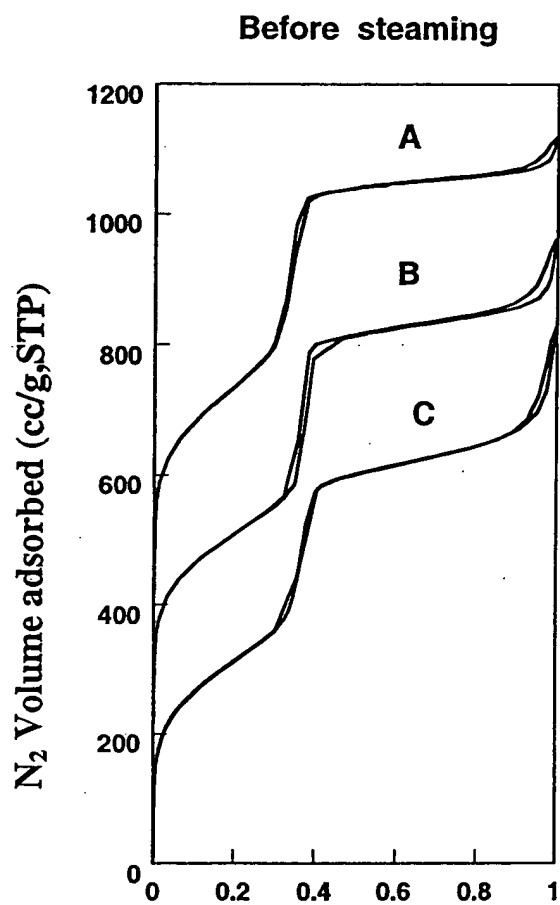
2θ (degrees)

Figure 17A

Figure 17B

Figure 17C

1006121-2495001



Transmittance (a.u.)



**Figure 19**

The figure displays two X-ray diffraction patterns, A and B, for poly(2-vinylpyridine). The x-axis represents the diffraction angle  $2\Theta$  in degrees, ranging from 0 to 6. Curve A, representing the sample after 10 days in benzene, shows sharp, well-defined peaks at approximately 0.8, 1.0, and 1.5 degrees, labeled 100, 110, and 200 respectively. Curve B, representing the sample after 10 days in water, shows a broad, amorphous-like peak centered around 1.5 degrees, indicating a loss of crystalline structure.

**Figure 20**

100547-4956001

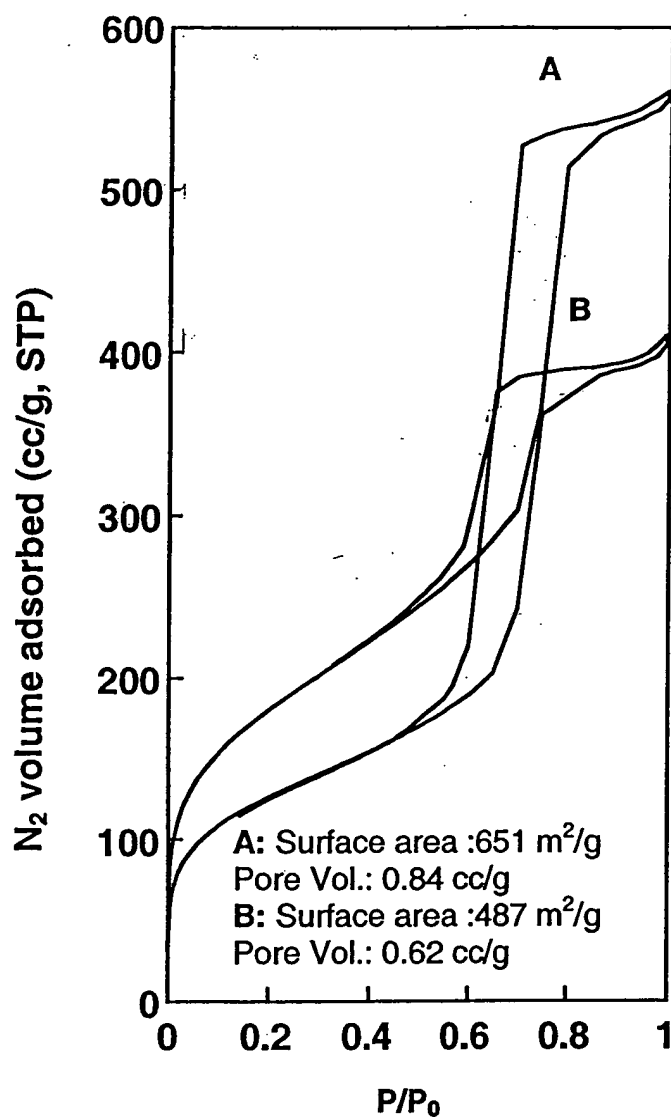


Figure 21

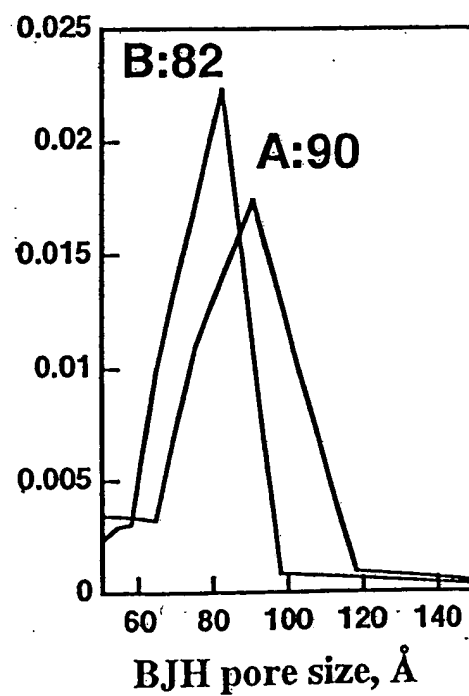


Figure 21A

100507 243000

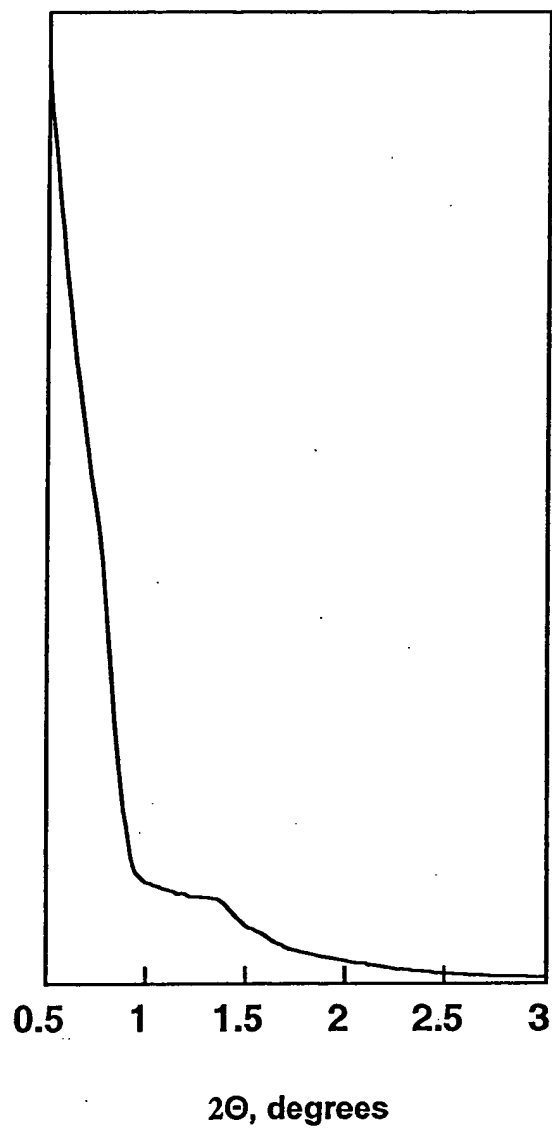


Figure 22

1061317 24355004

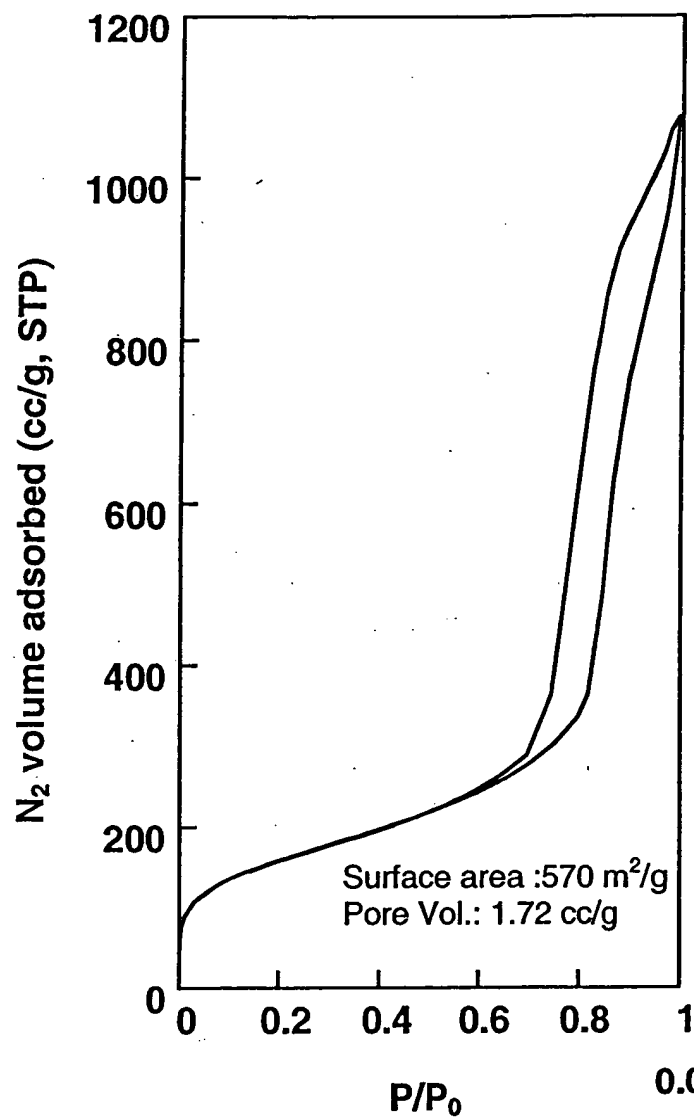


Figure 23

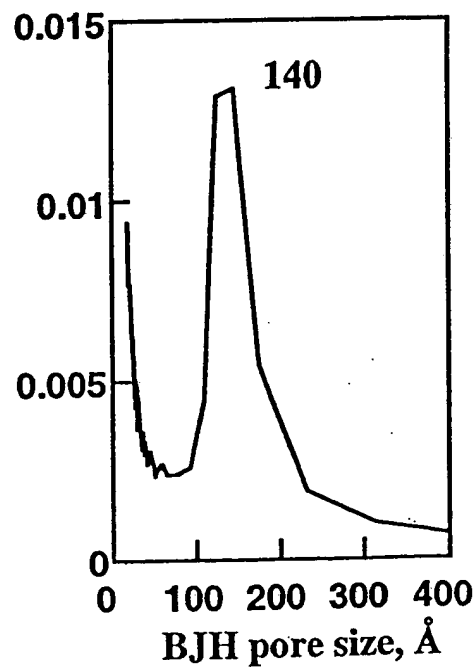


Figure 23A



100047-131001

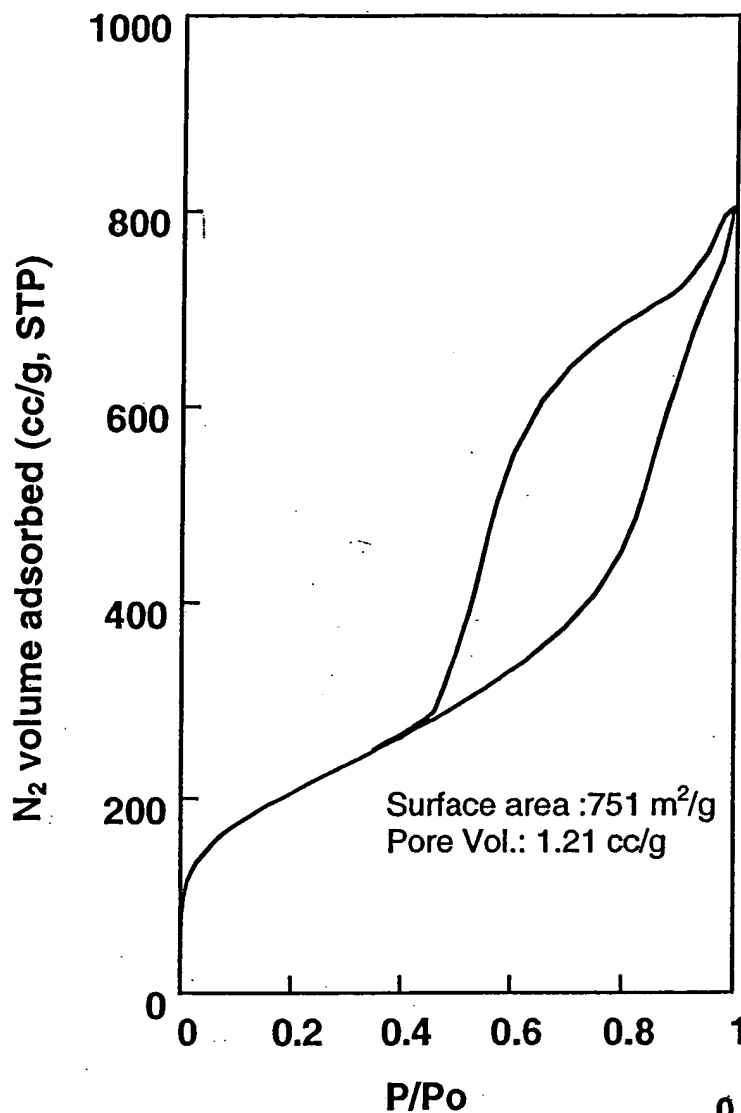


Figure 24

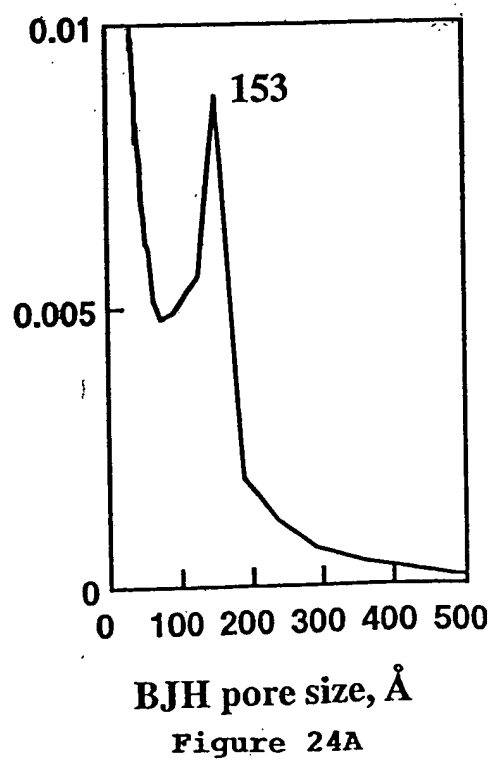


Figure 24A

100547 10004

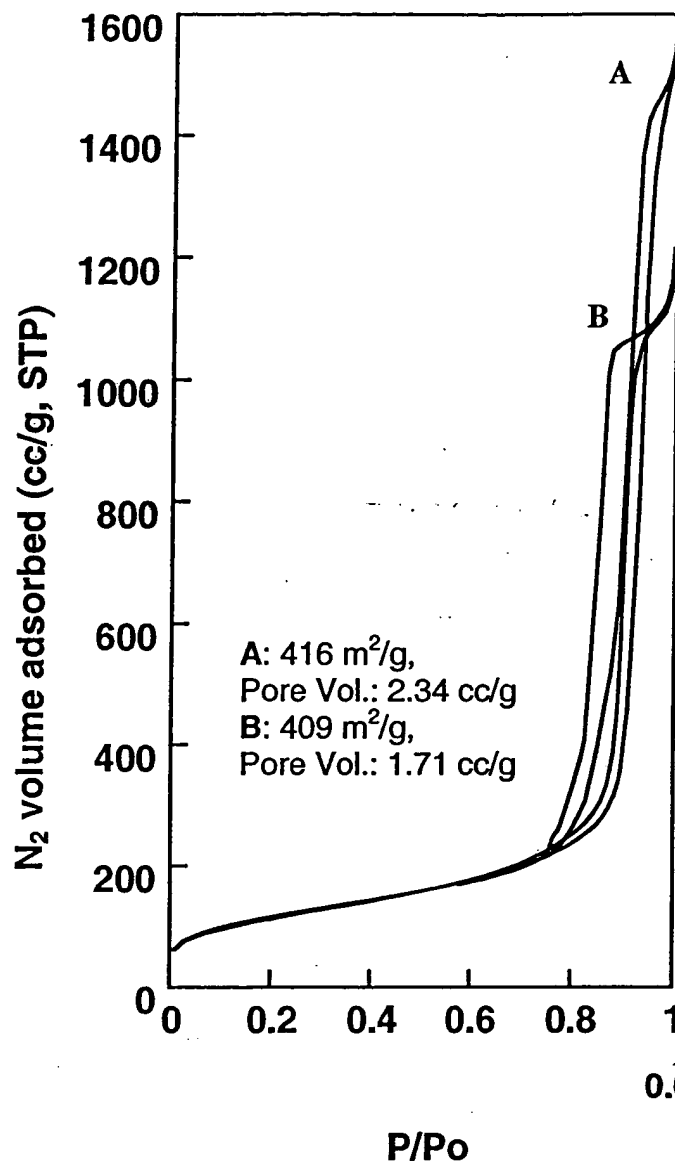


Figure 25

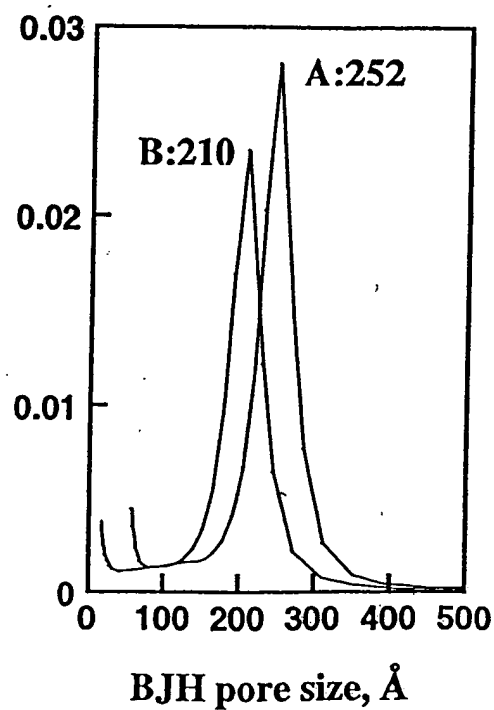


Figure 25A

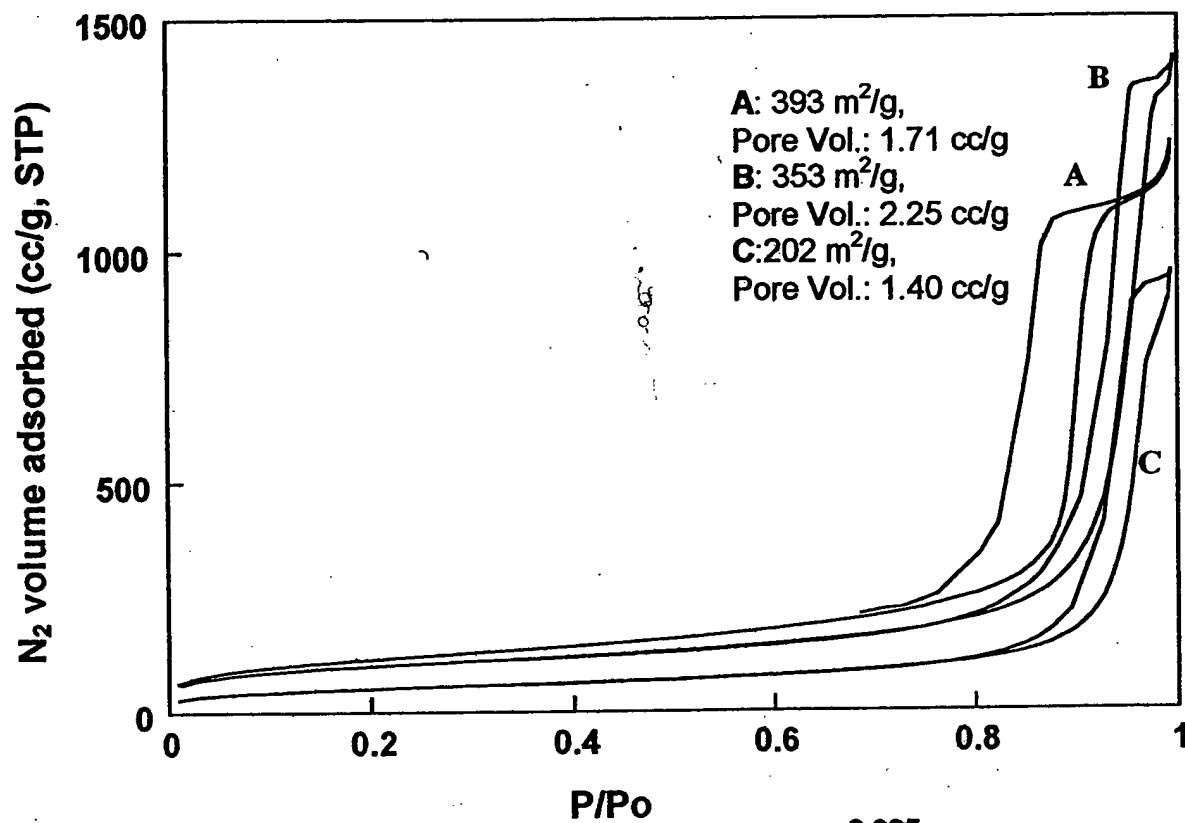


Figure 26

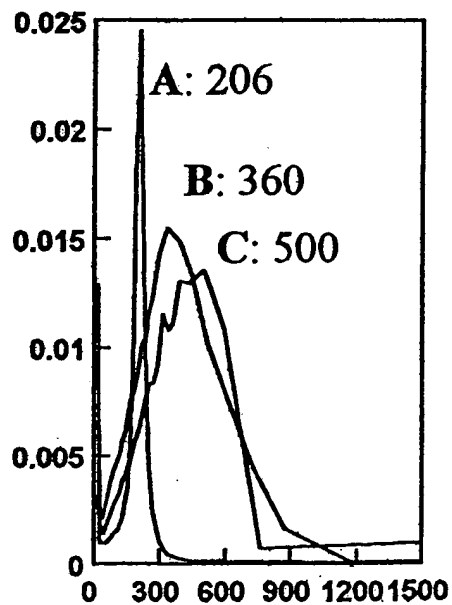


Figure 26A

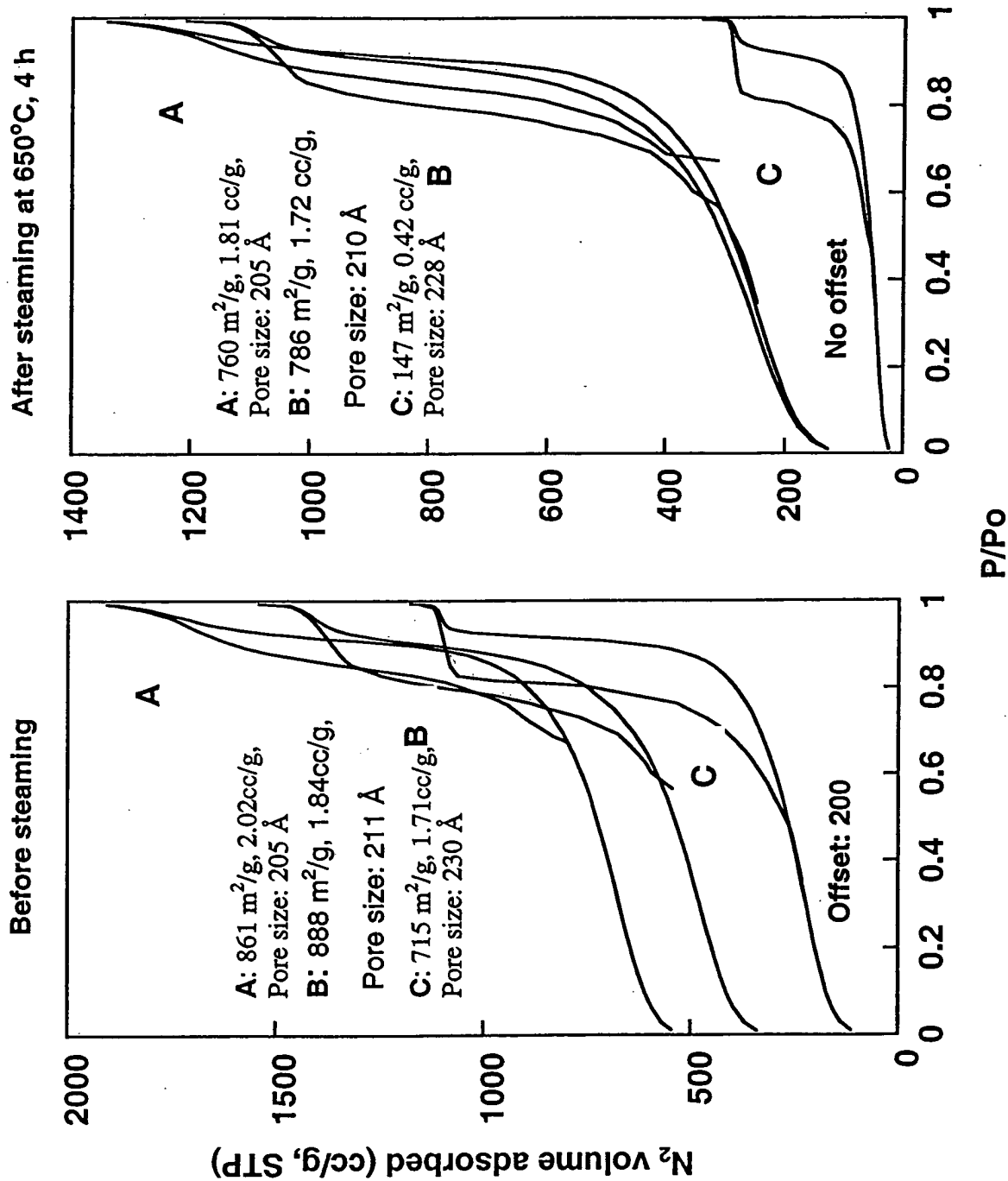


Figure 27A

Figure 27B

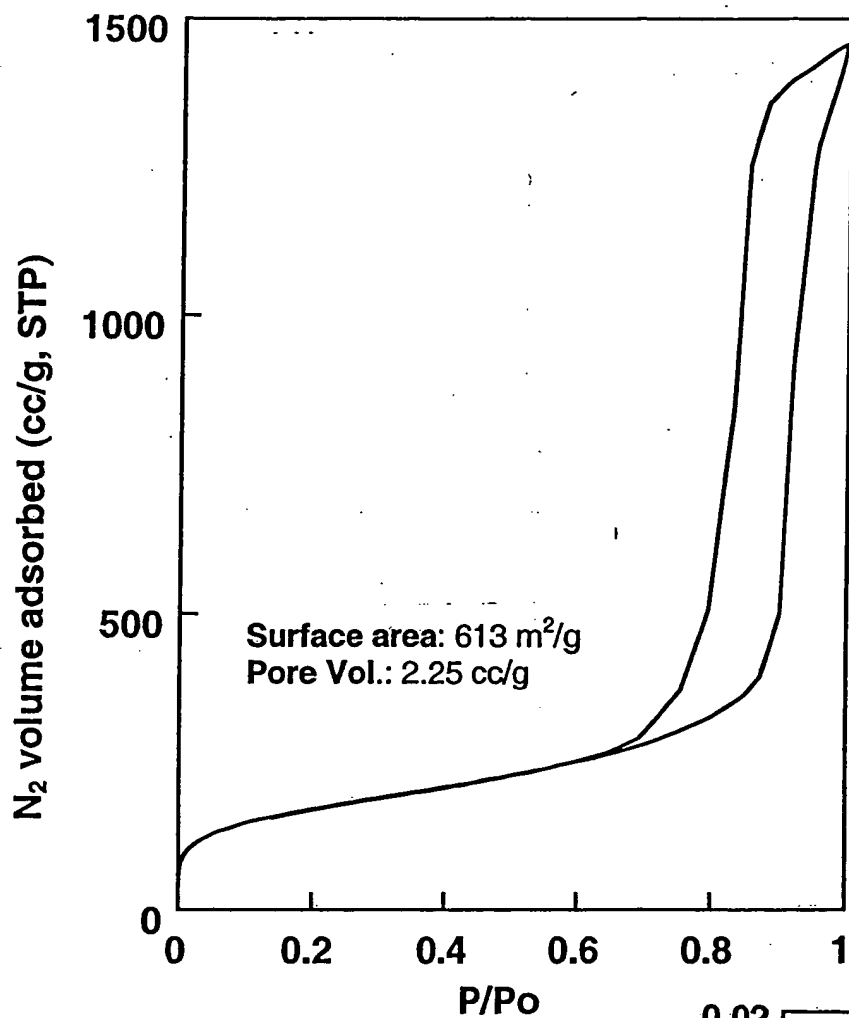


Figure 28

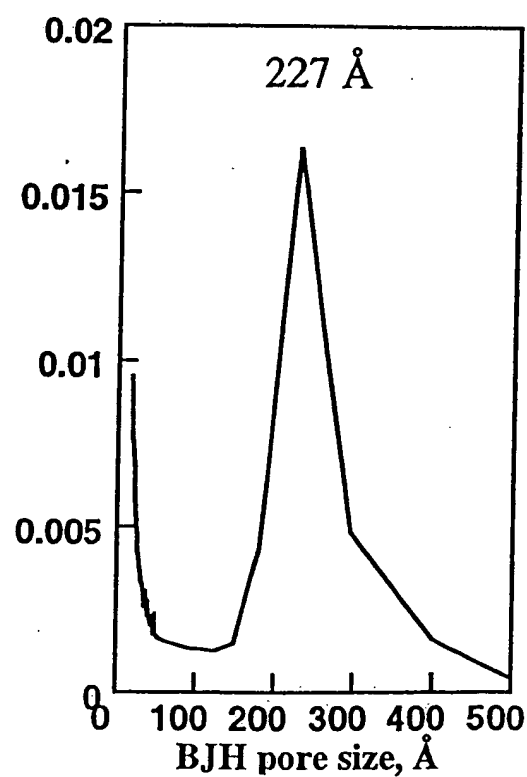


Figure 28A

The figure displays two X-ray diffraction patterns, labeled A and B, plotted against the diffraction angle  $2\theta$  in degrees. The x-axis ranges from 0 to 12 degrees with major tick marks every 2 units. Pattern A, corresponding to poly(2-vinylpyridine), shows a sharp, intense peak at approximately 3.5 nm, with a label '3.5 nm' placed above the peak. Pattern B, corresponding to poly(2-vinylpyridine-co-vinyl acetate), shows a sharp peak at approximately 3.3 nm, with a label '3.3 nm' placed above the peak. Both patterns exhibit a broad, low-intensity halo centered around  $2\theta = 5^\circ$ , indicating a degree of crystallinity or ordered structure in the polymers.

### Figure 29

1007-2496001

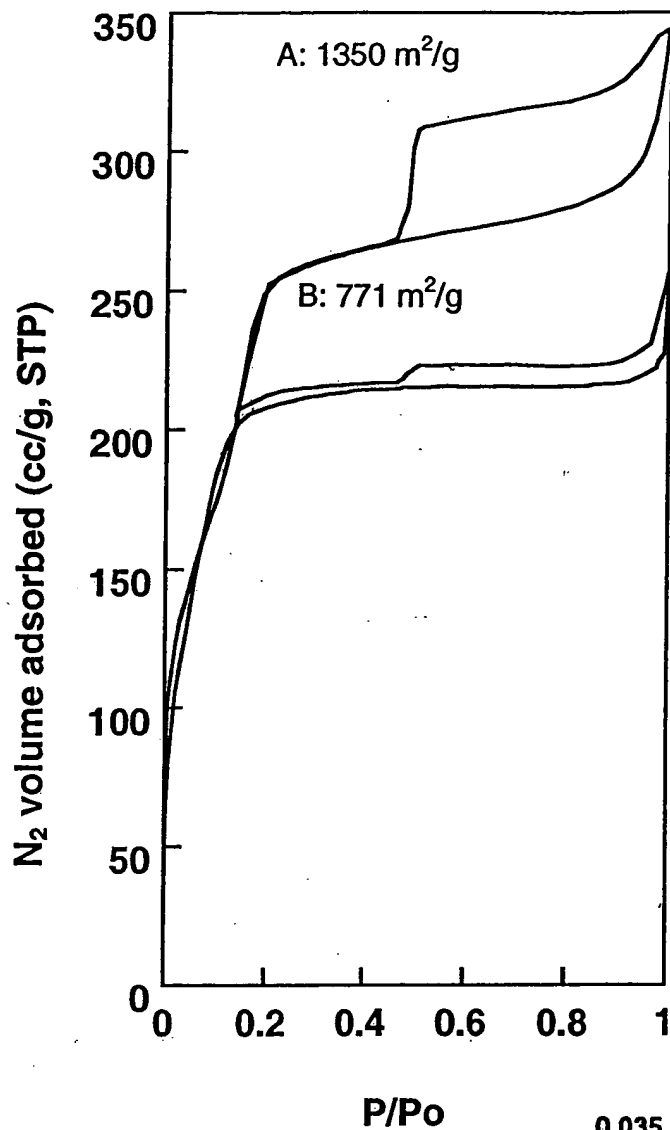


Figure 30

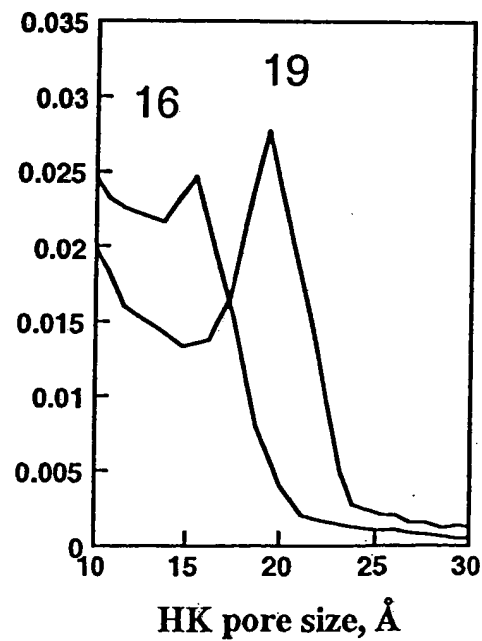


Figure 30A

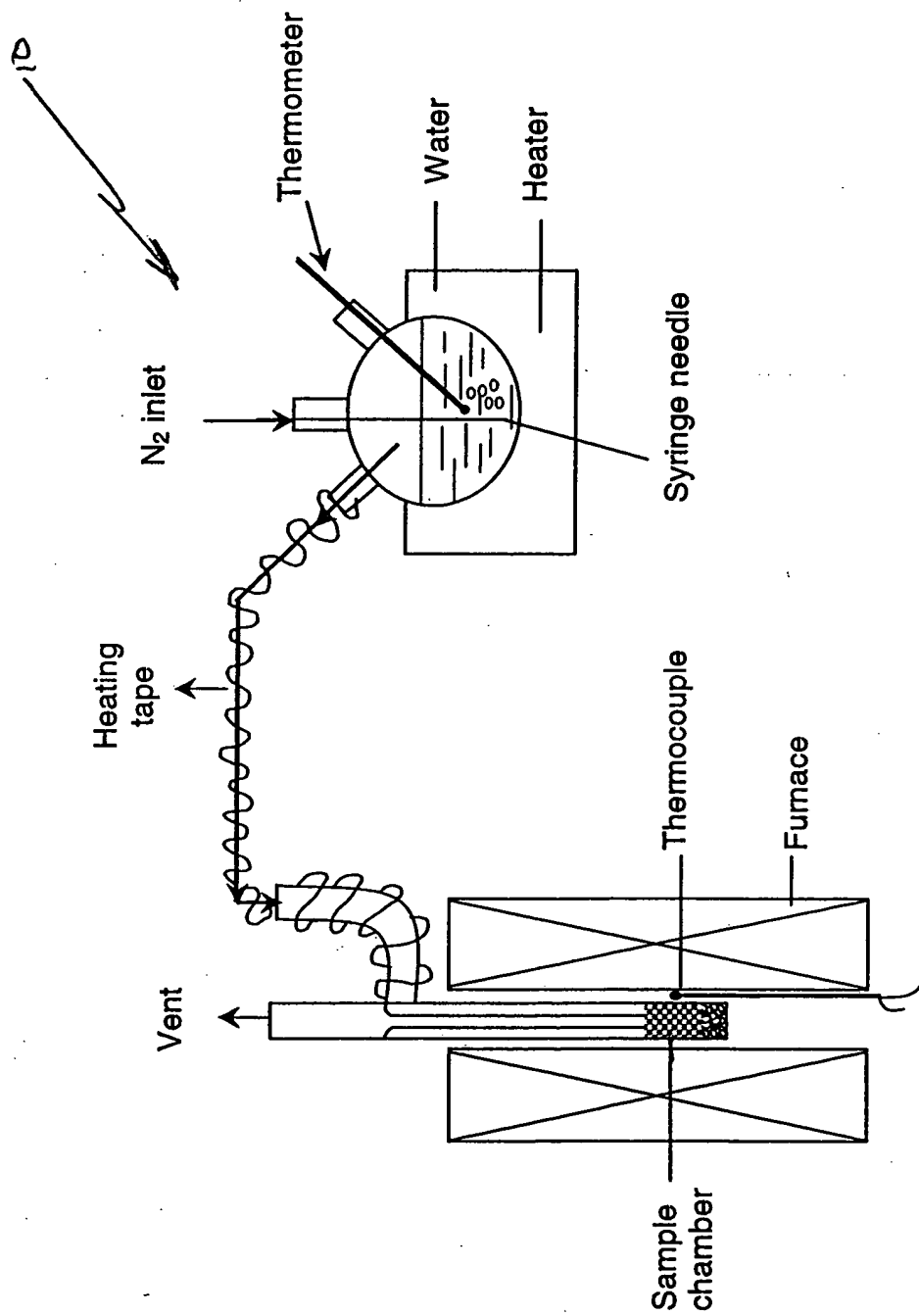
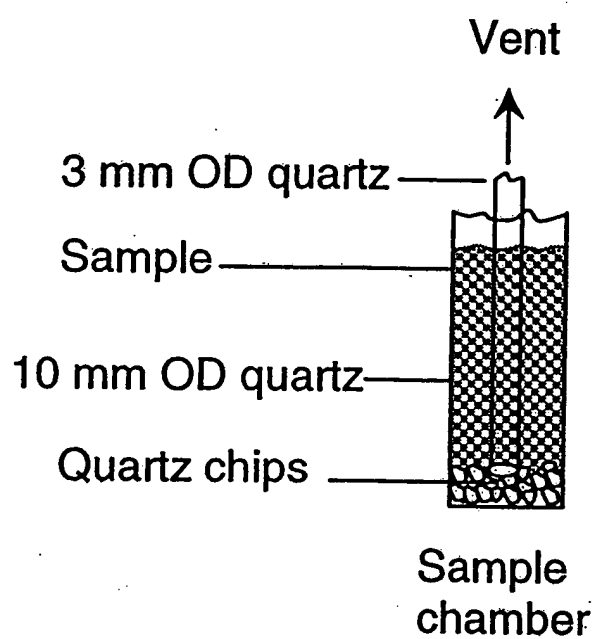


Figure 31



40085647 121301



**Figure 31A**

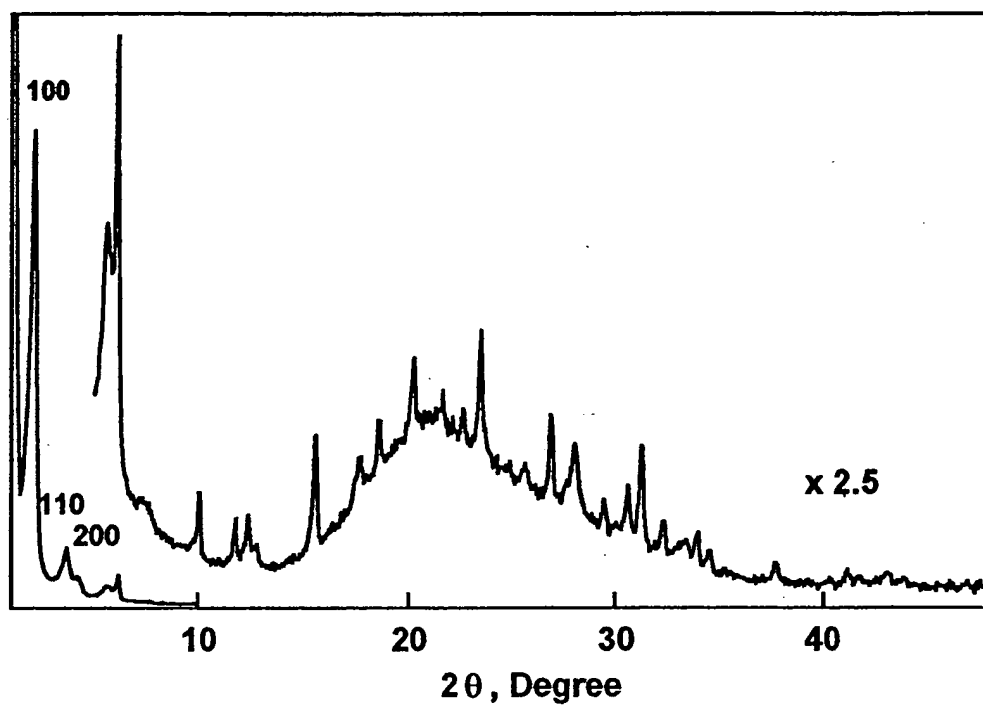
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FIGURE 33 (Sample 31)

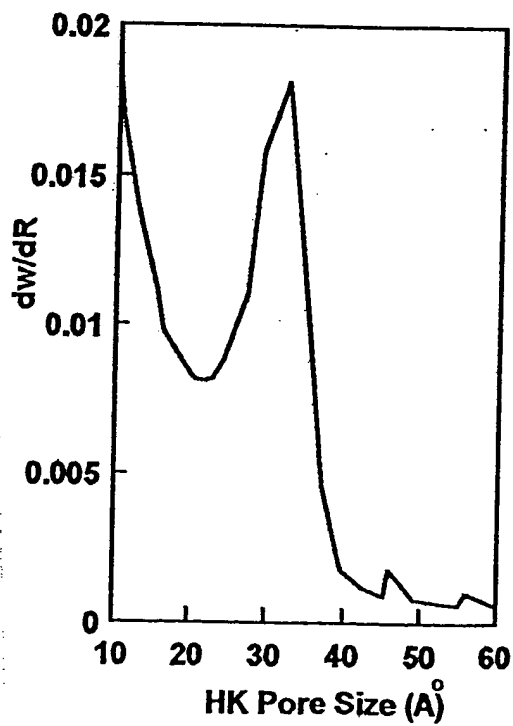
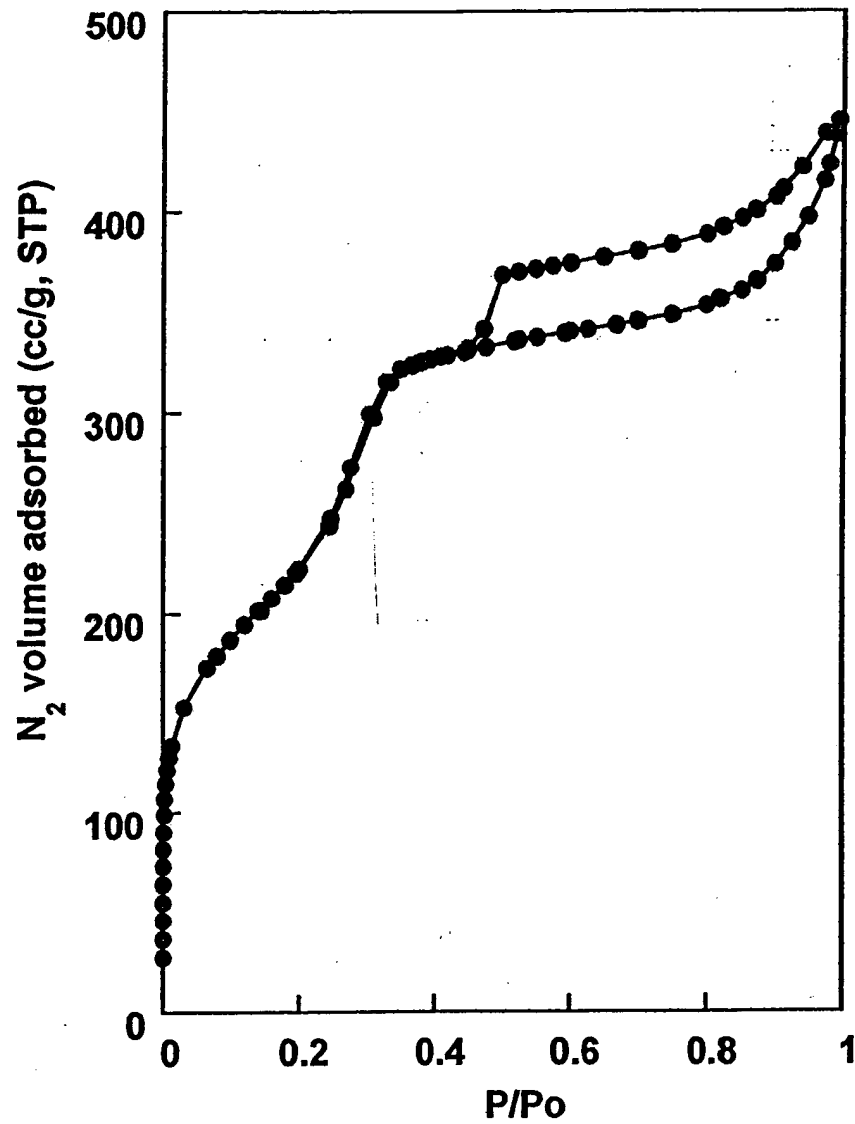


FIGURE 33A

FIGURE 34 (Example 31)

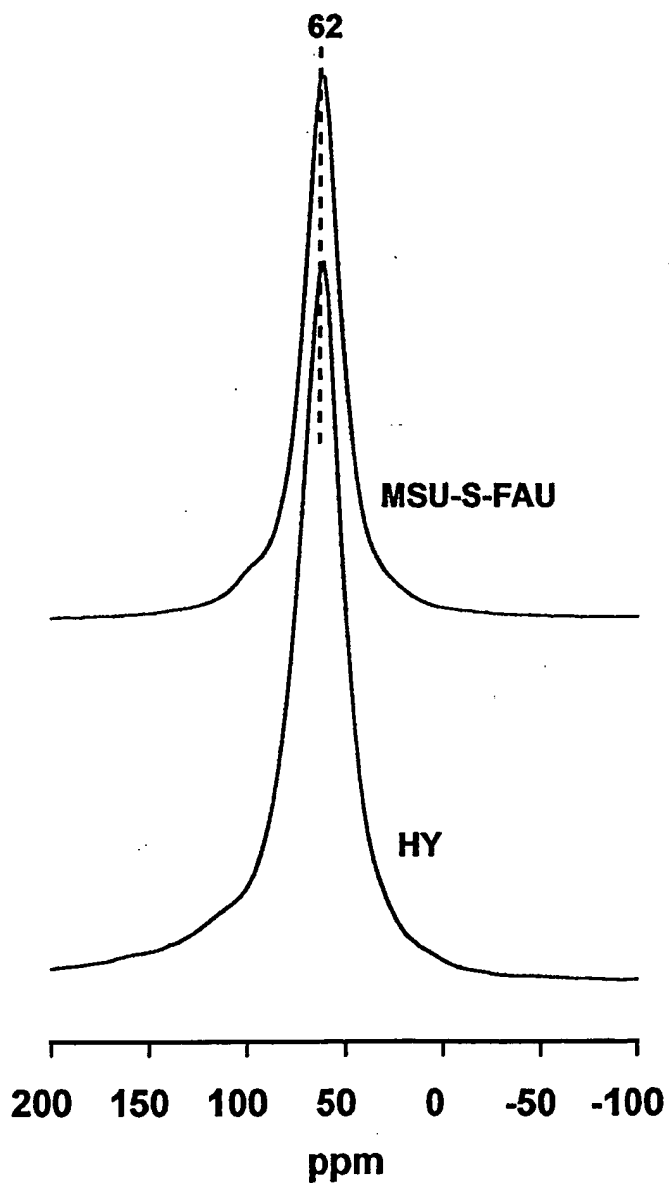
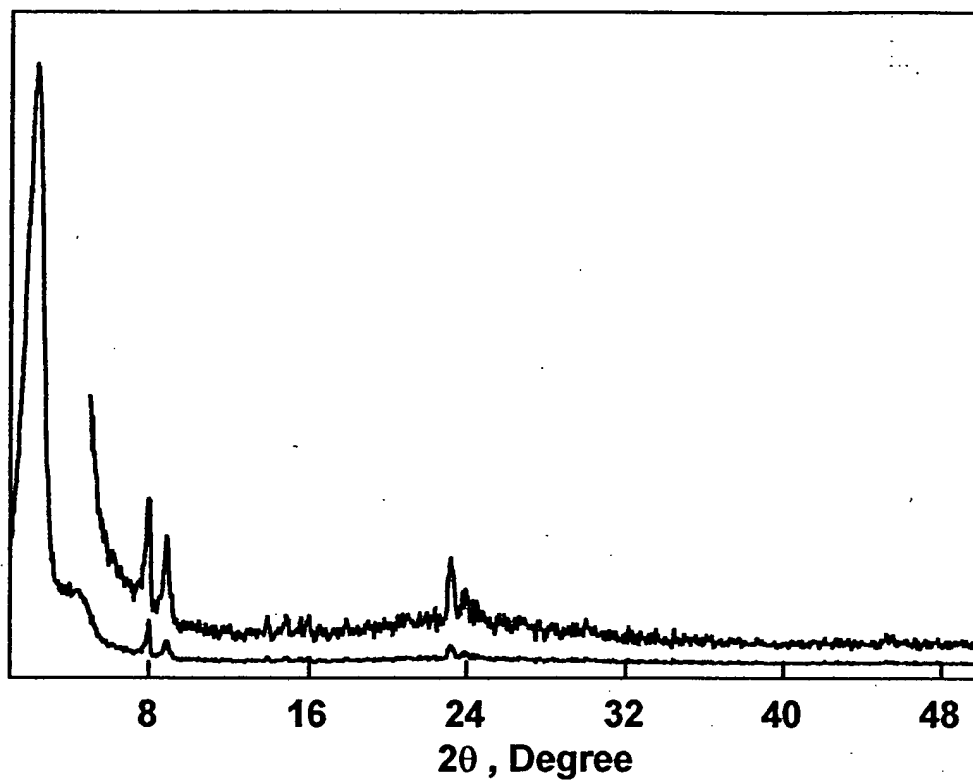


FIGURE 35 (Example 32)



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1003547 151901

FIGURE 36 (Example 32)

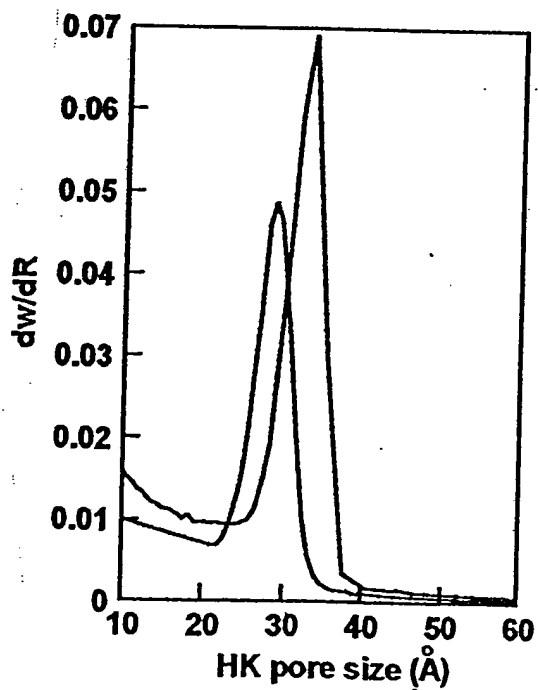
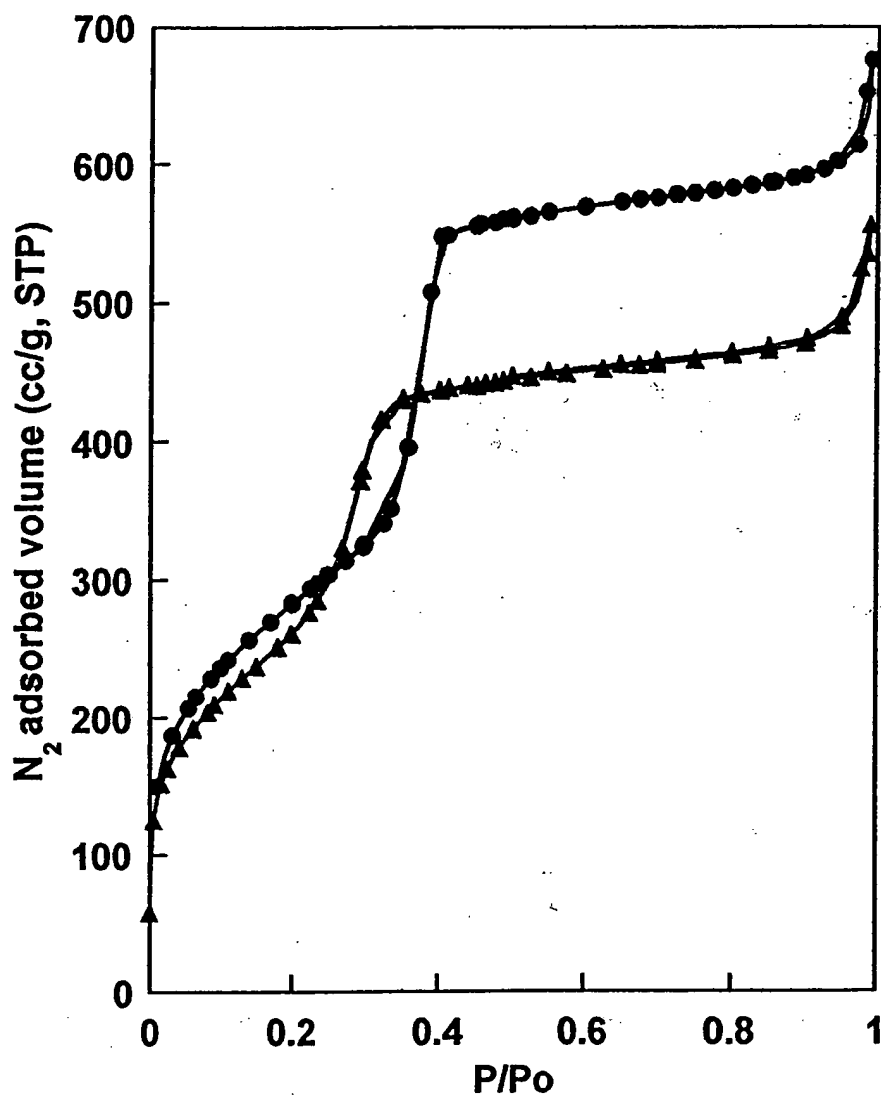


FIGURE 36A

FIGURE 37 (Example 33)

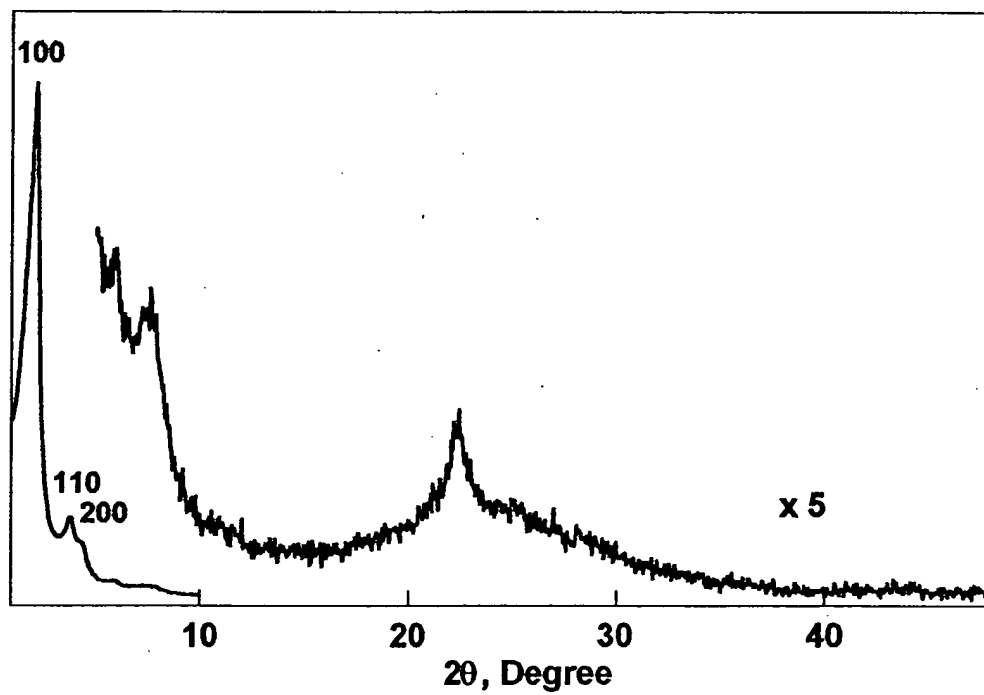


FIGURE 38 (Example 33)

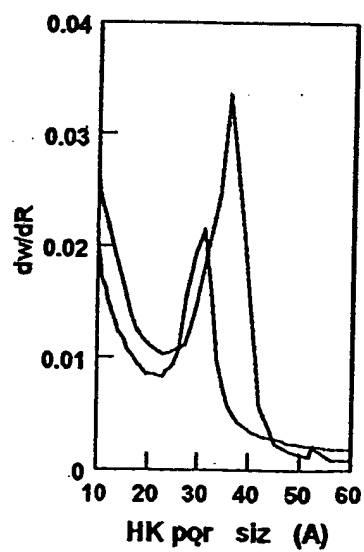
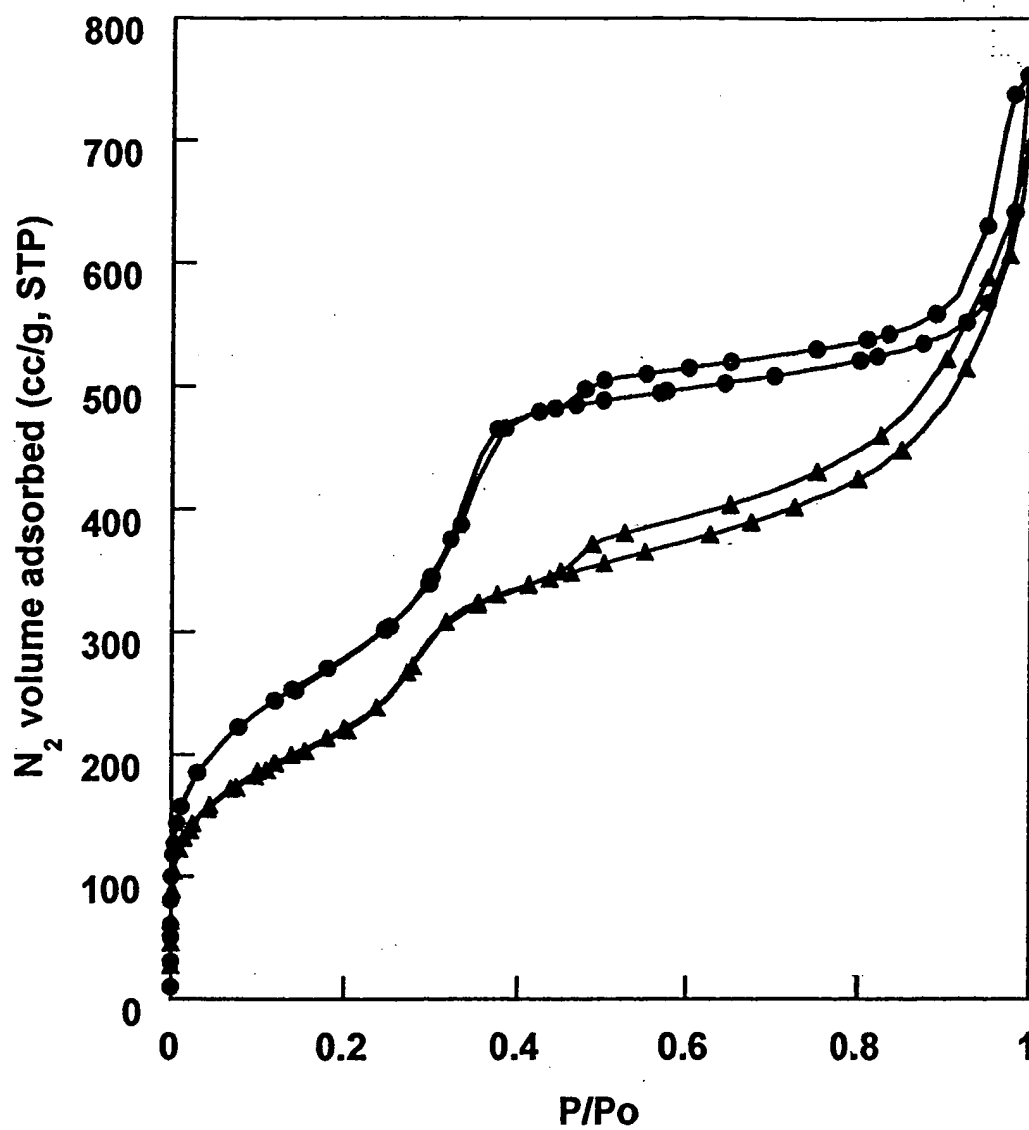
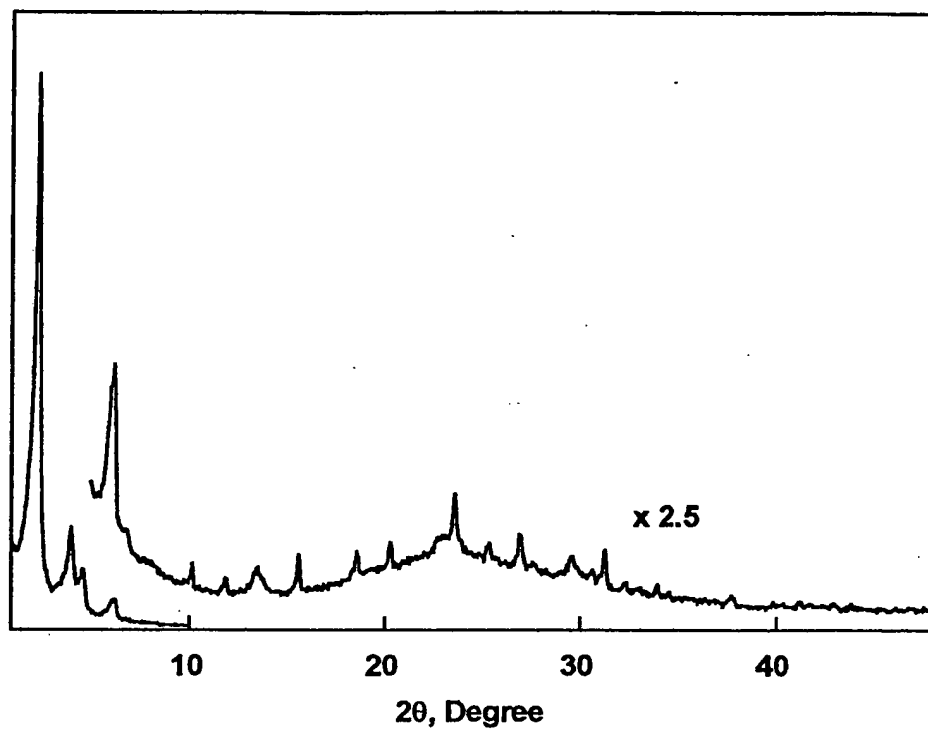


FIGURE 38A



FIGURE 39 (Example 34)



1008547 124901

FIGURE 40 (Sample 34)

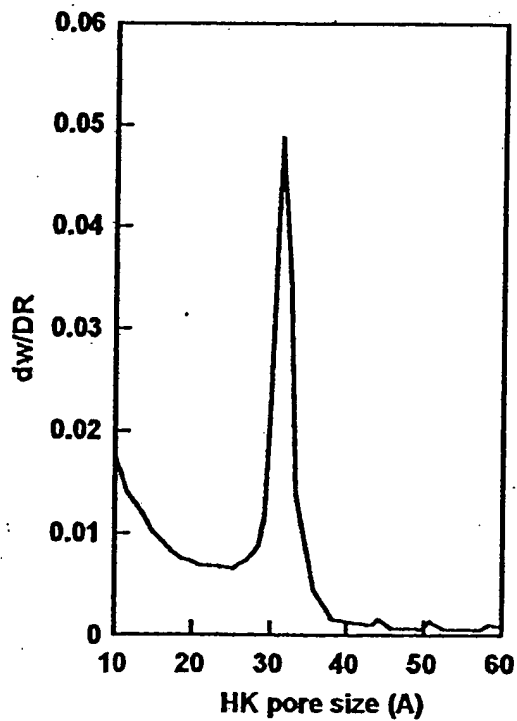
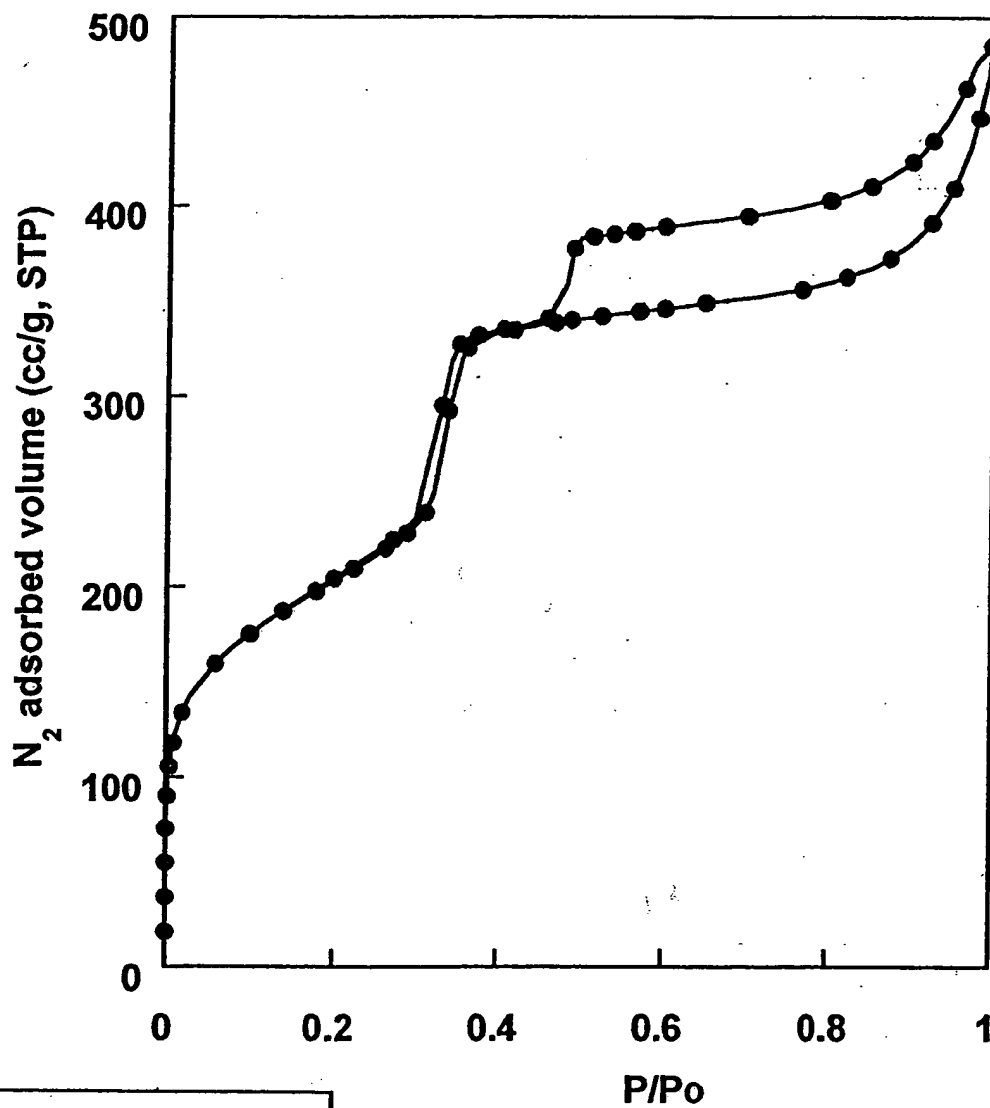
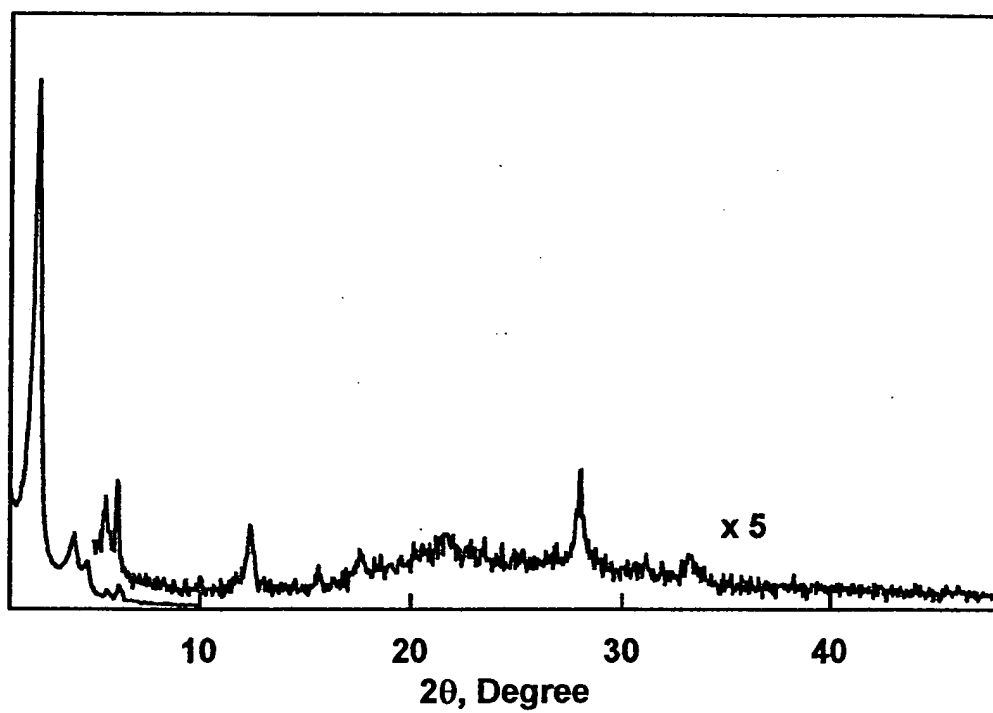


FIGURE 40A

FIGURE 41 (Example 35)



10025647.121504

FIGURE 42 (Example 35)

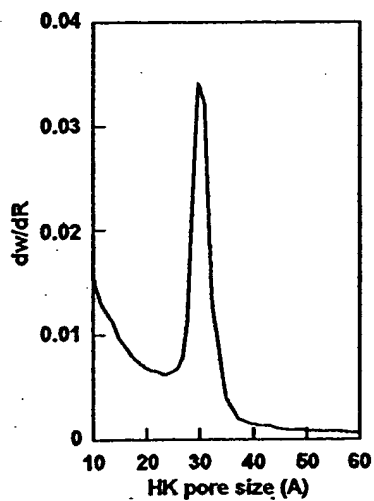
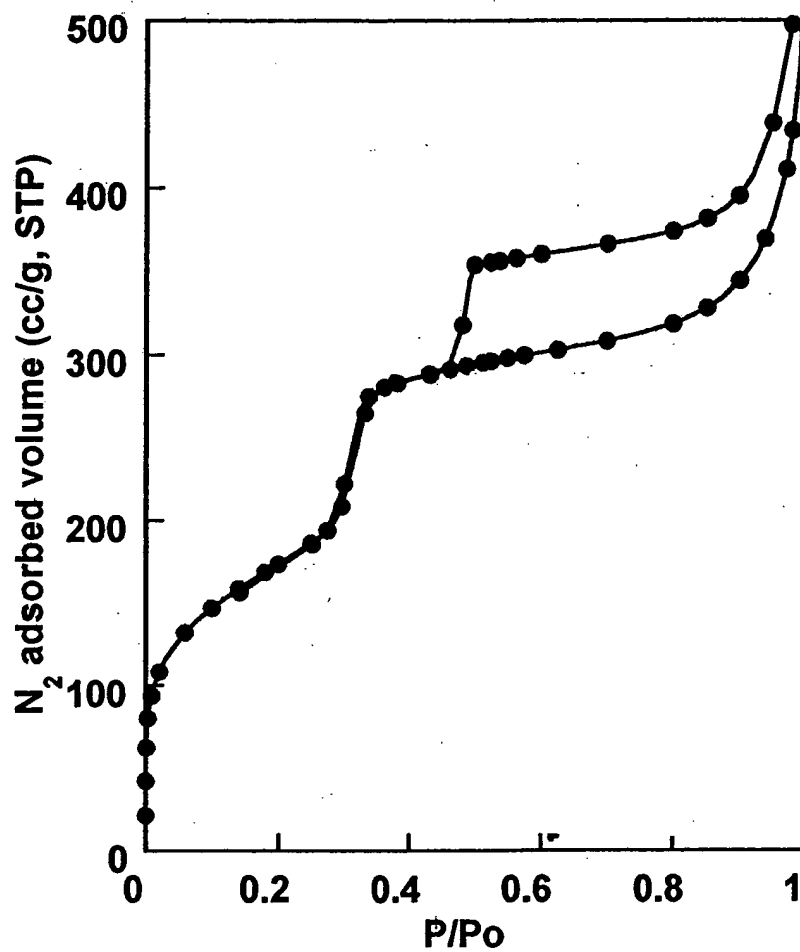


FIGURE 42A

FIGURE 43 (Example 36)

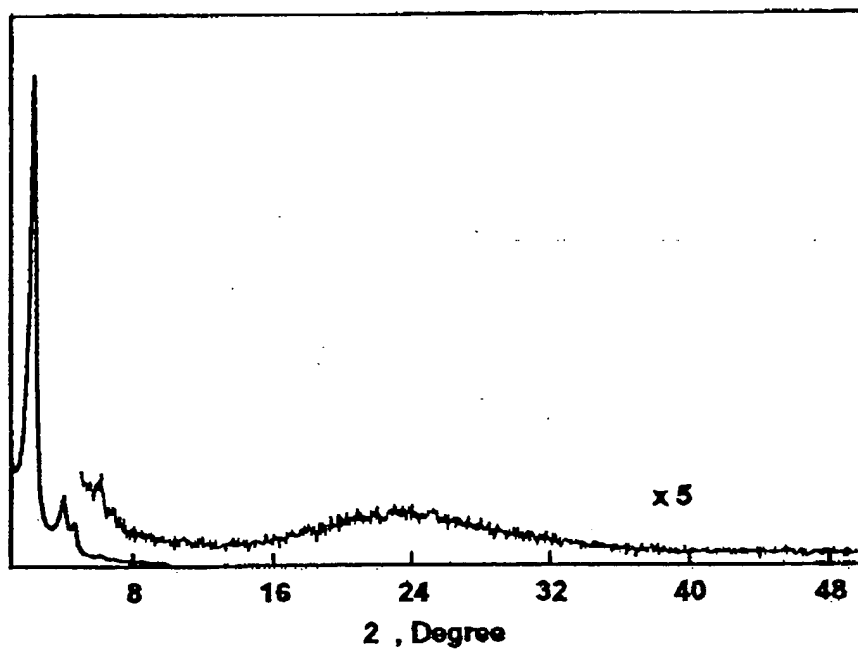


FIGURE 44 (Example 36)

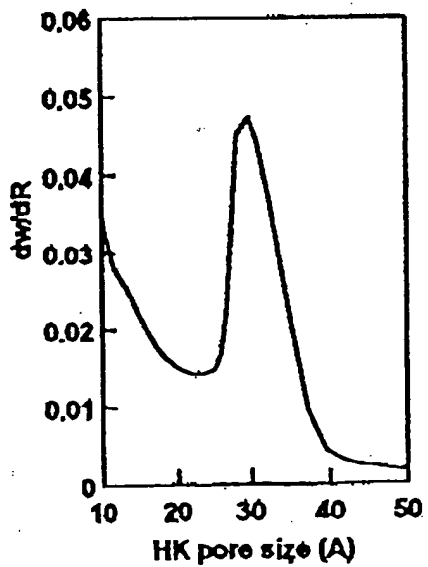
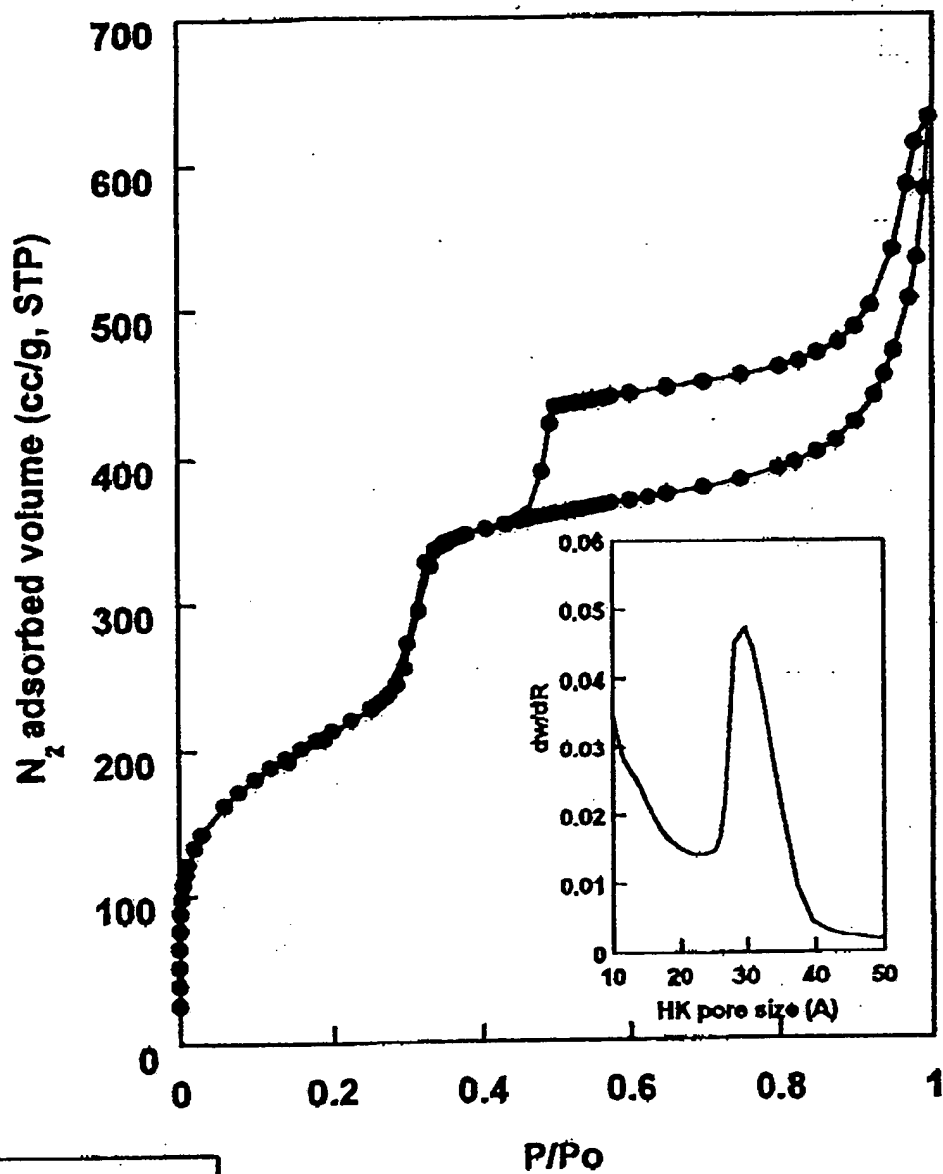


FIGURE 44A

FIGURE 45 (Example 37)

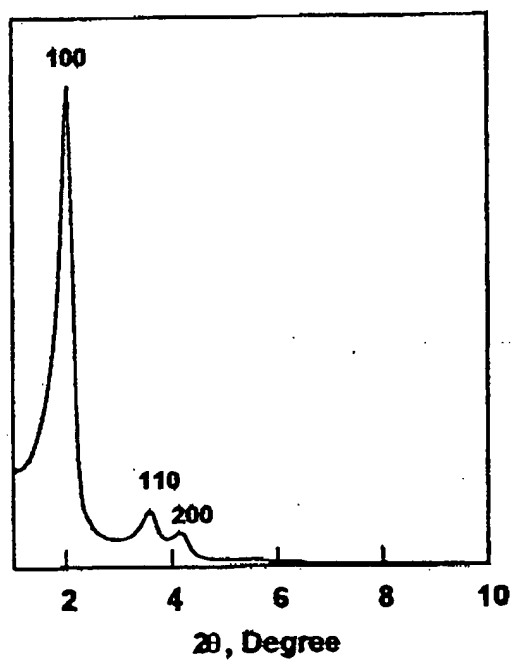
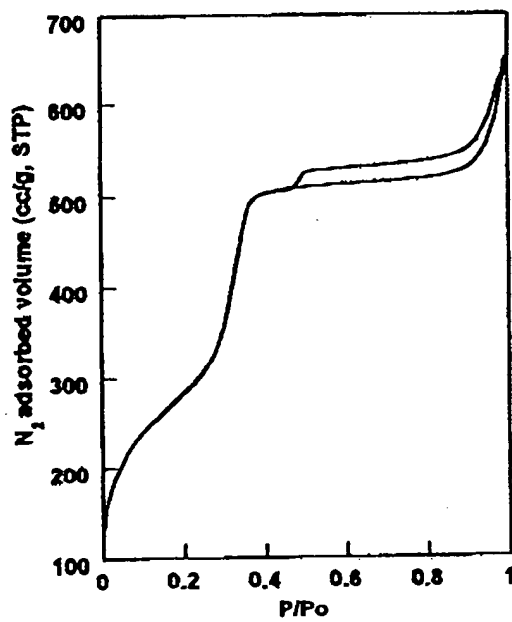


FIGURE 46 (Example 37)



10035647 1014901

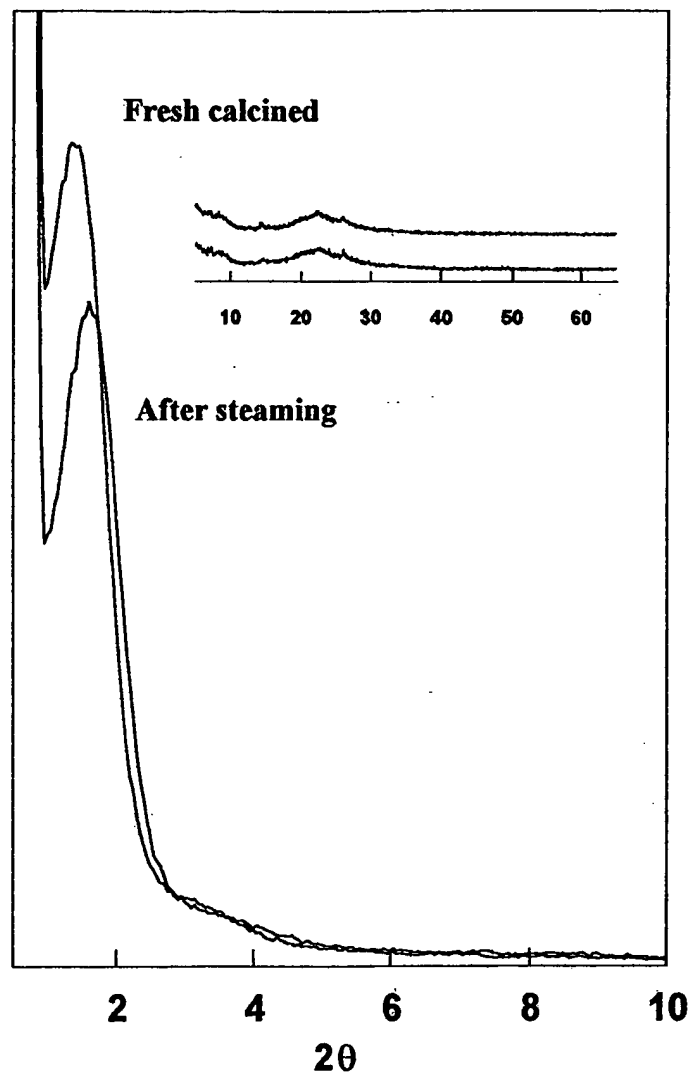


FIGURE 47



10035647 131904  
FOI b7E b7C b7D

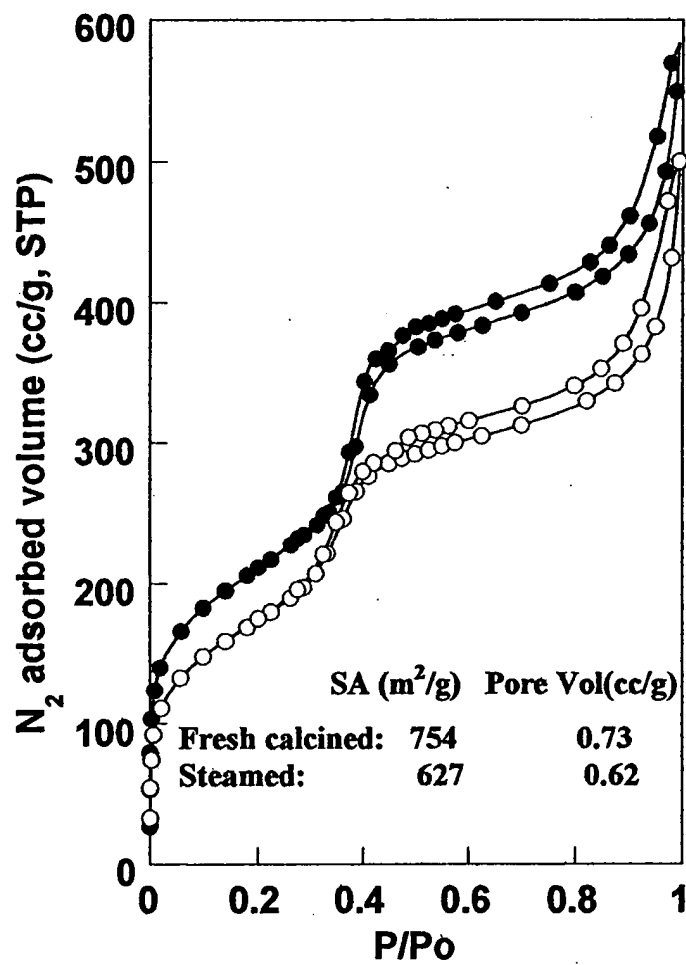
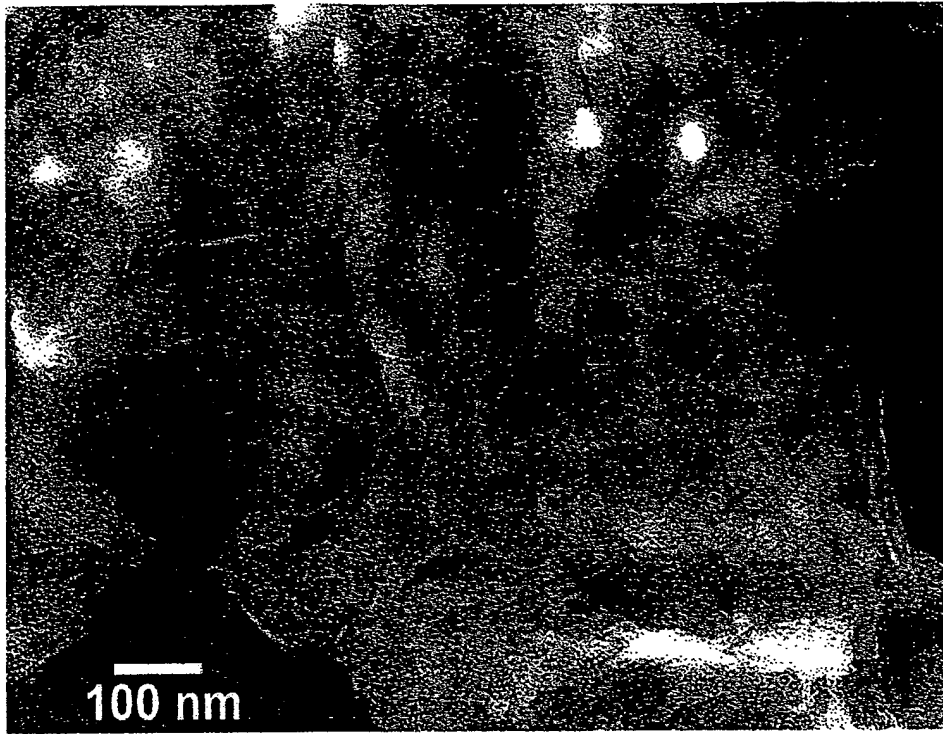


FIGURE 48



**FIGURE 49**

1005647 1015001  
1061217 2495001

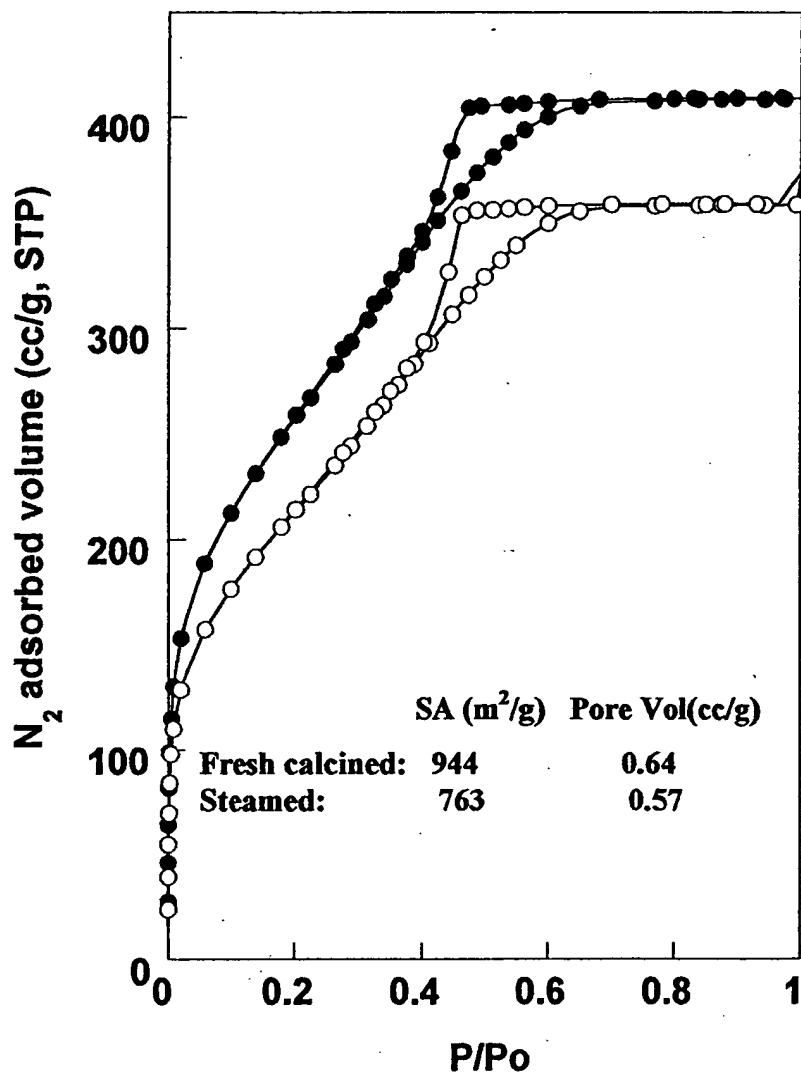


FIGURE 50

10025547 121901

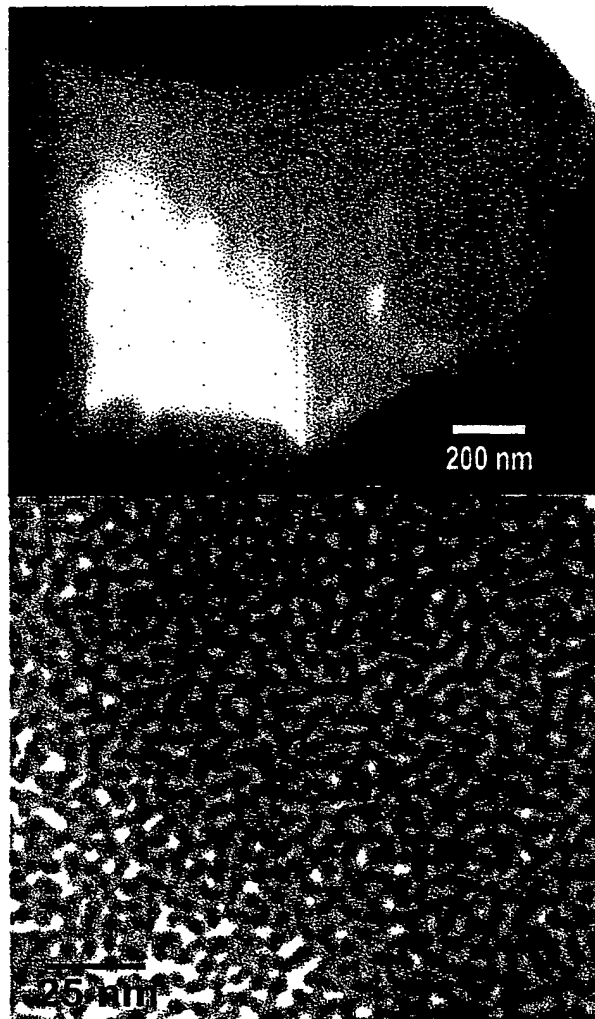


FIGURE 51